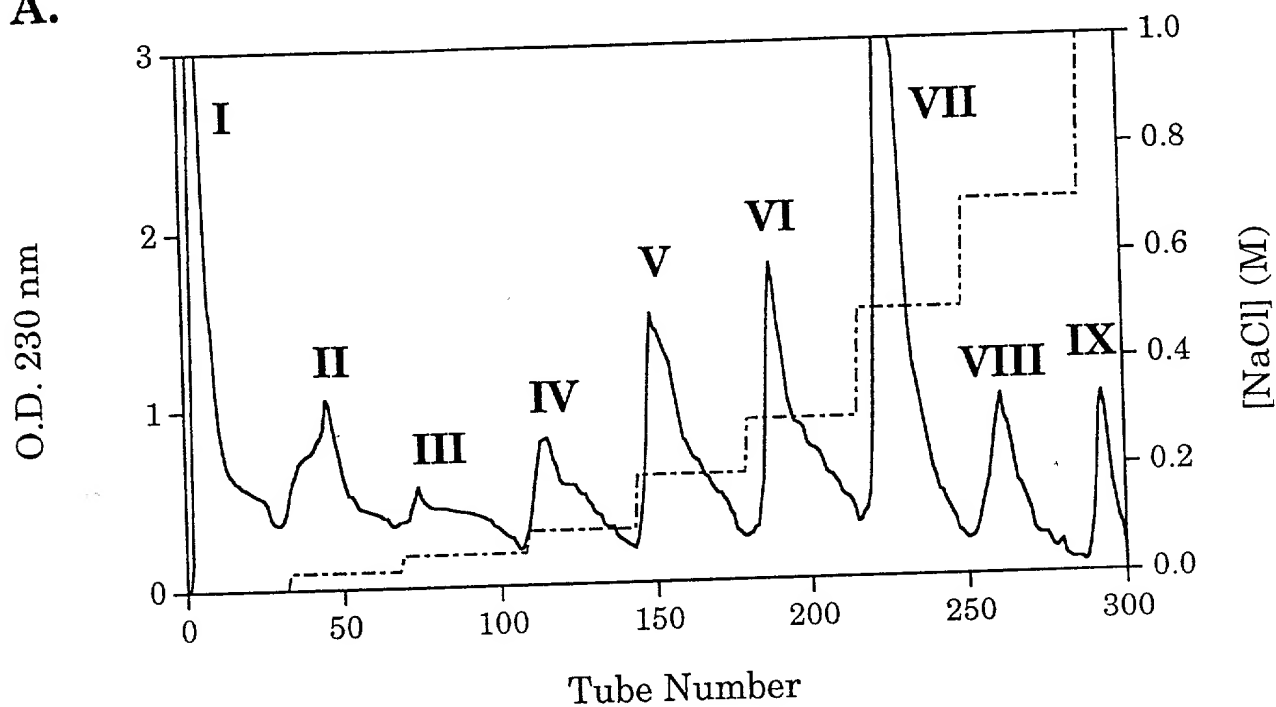
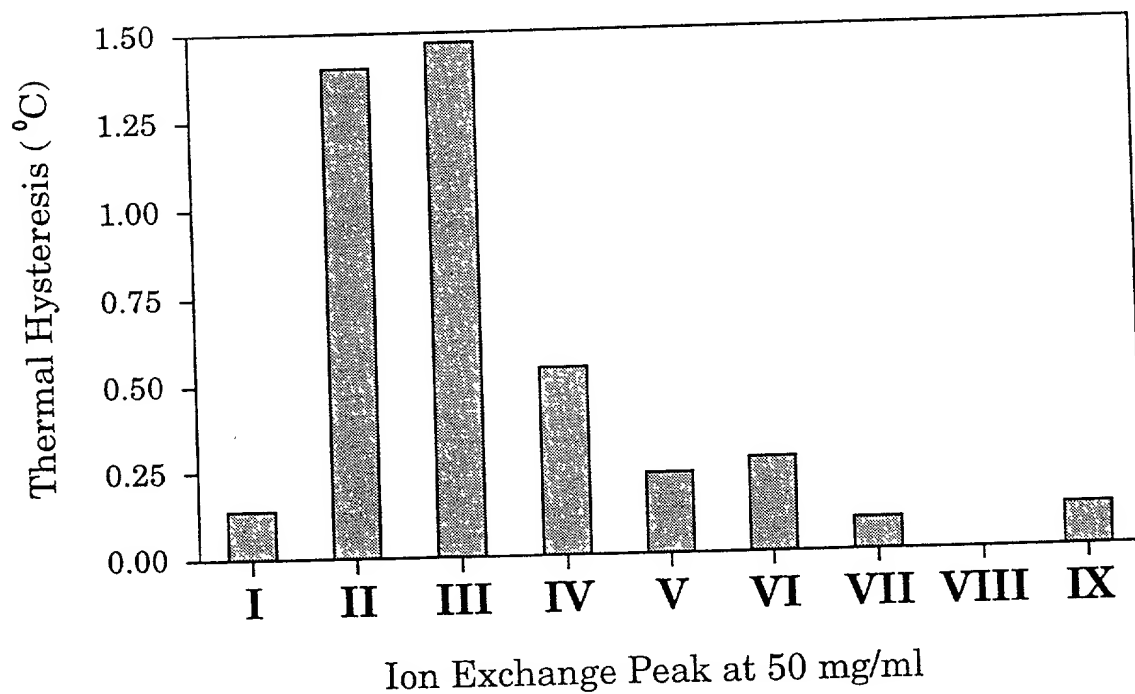


FIG 1.0

**A.**



**B.**



**FIG 1.1**

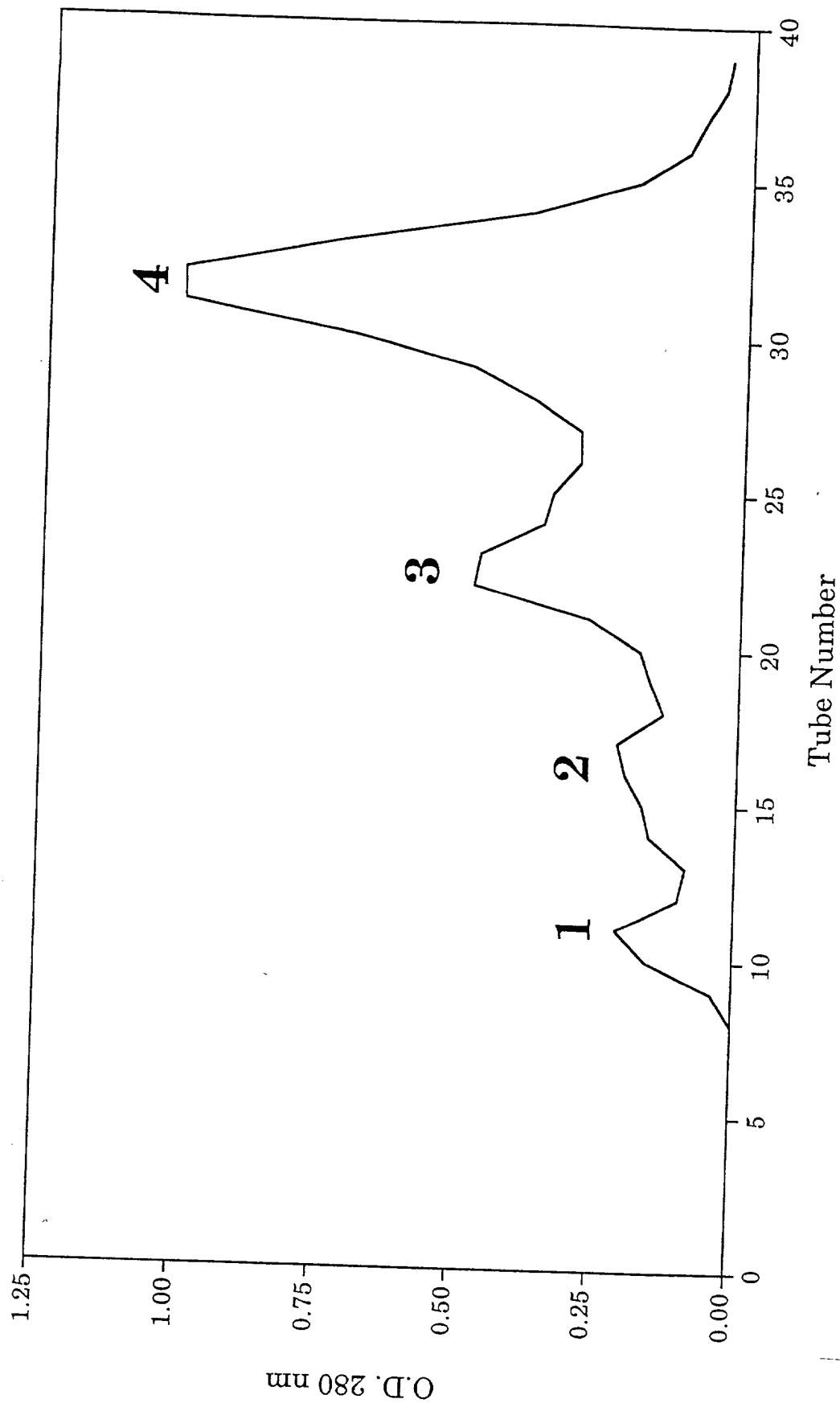


FIG 1.2

FOI 2000-04292860

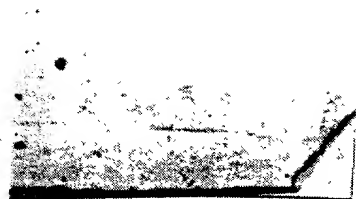


FIG 1.3

Tm-12.86

12.5

25

FIG 1.4

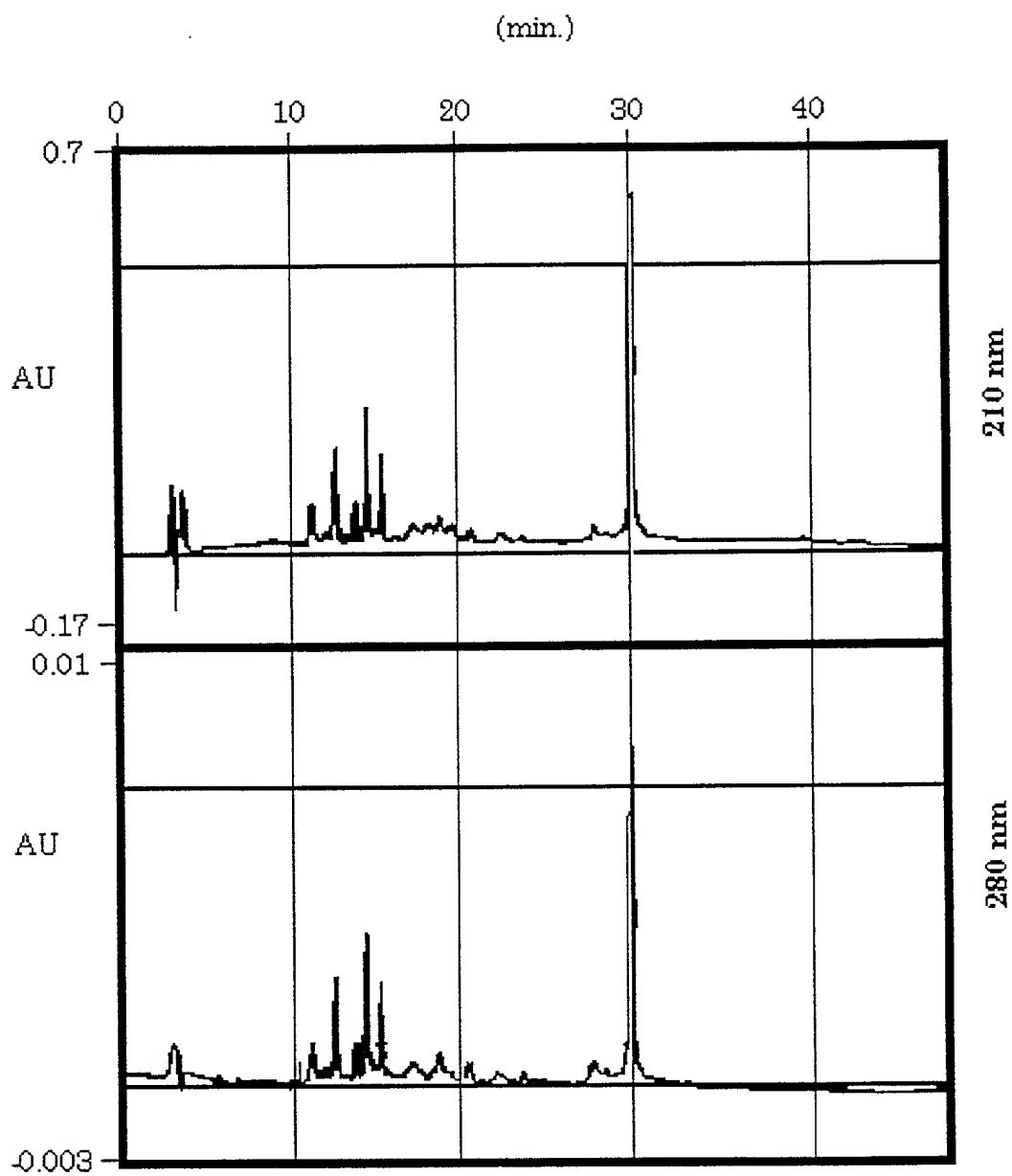


FIG 1.5

FOI b7c b7d b7e b7f b7g b7h b7i b7j b7k b7l b7m b7n b7o b7p b7q b7r b7s b7t b7u b7v b7w b7x b7y b7z

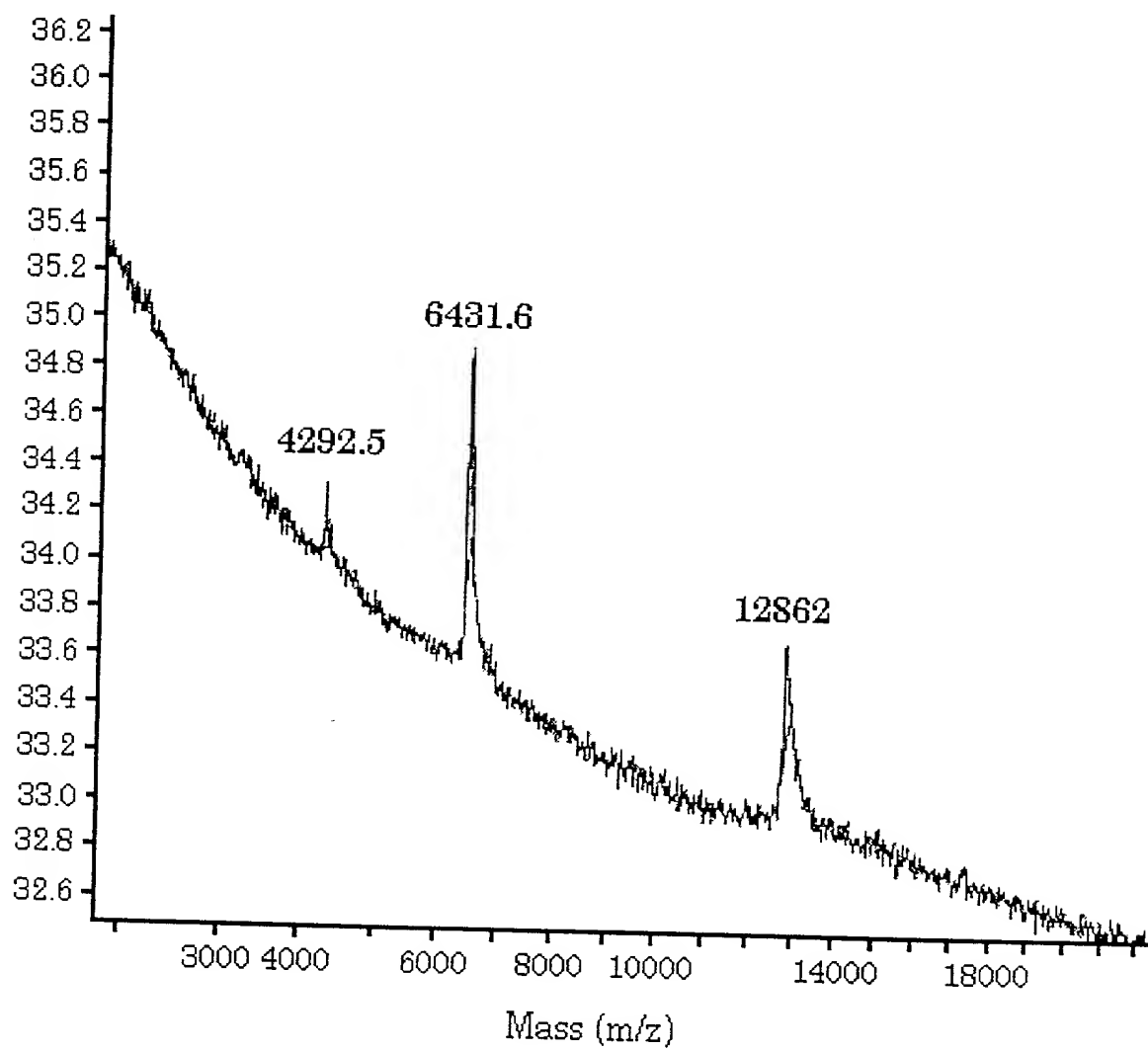


FIG 1.6

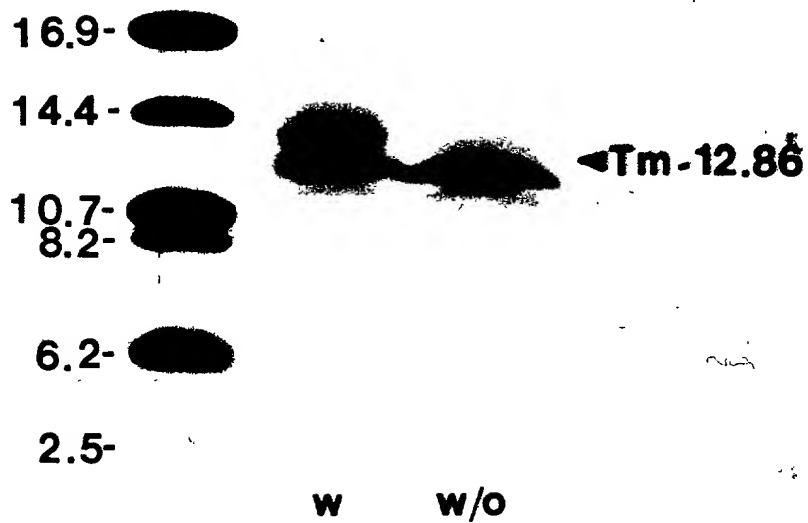


FIG 1.7

NH<sub>2</sub>-L-T-D-E-Q-I-Q-K-R-N-K-I-S-K-E-?-Q-Q-V  
Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys Glu Gln Gln Val

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Gln | Gln | Lys | Ser | Ile | Lys | Asn | Arg | Lys | Gln | Ile | Gln | Asp | Thr | Leu |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

**FIG. 1.8**

| 1979-1980 |  | 1980-1981 |  | 1981-1982 |  | 1982-1983 |  | 1983-1984 |  | 1984-1985 |  | 1985-1986 |  | 1986-1987 |  | 1987-1988 |  | 1988-1989 |  | 1989-1990 |  | 1990-1991 |  | 1991-1992 |  | 1992-1993 |  | 1993-1994 |  | 1994-1995 |  | 1995-1996 |  | 1996-1997 |  | 1997-1998 |  | 1998-1999 |  | 1999-2000 |  | 2000-2001 |  | 2001-2002 |  | 2002-2003 |  | 2003-2004 |  | 2004-2005 |  | 2005-2006 |  | 2006-2007 |  | 2007-2008 |  | 2008-2009 |  | 2009-2010 |  | 2010-2011 |  | 2011-2012 |  | 2012-2013 |  | 2013-2014 |  | 2014-2015 |  | 2015-2016 |  | 2016-2017 |  | 2017-2018 |  | 2018-2019 |  | 2019-2020 |  | 2020-2021 |  | 2021-2022 |  | 2022-2023 |  | 2023-2024 |  | 2024-2025 |  | 2025-2026 |  | 2026-2027 |  | 2027-2028 |  | 2028-2029 |  | 2029-2030 |  | 2030-2031 |  | 2031-2032 |  | 2032-2033 |  | 2033-2034 |  | 2034-2035 |  | 2035-2036 |  | 2036-2037 |  | 2037-2038 |  | 2038-2039 |  | 2039-2040 |  | 2040-2041 |  | 2041-2042 |  | 2042-2043 |  | 2043-2044 |  | 2044-2045 |  | 2045-2046 |  | 2046-2047 |  | 2047-2048 |  | 2048-2049 |  | 2049-2050 |  | 2050-2051 |  | 2051-2052 |  | 2052-2053 |  | 2053-2054 |  | 2054-2055 |  | 2055-2056 |  | 2056-2057 |  | 2057-2058 |  | 2058-2059 |  | 2059-2060 |  | 2060-2061 |  | 2061-2062 |  | 2062-2063 |  | 2063-2064 |  | 2064-2065 |  | 2065-2066 |  | 2066-2067 |  | 2067-2068 |  | 2068-2069 |  | 2069-2070 |  | 2070-2071 |  | 2071-2072 |  | 2072-2073 |  | 2073-2074 |  | 2074-2075 |  | 2075-2076 |  | 2076-2077 |  | 2077-2078 |  | 2078-2079 |  | 2079-2080 |  | 2080-2081 |  | 2081-2082 |  | 2082-2083 |  | 2083-2084 |  | 2084-2085 |  | 2085-2086 |  | 2086-2087 |  | 2087-2088 |  | 2088-2089 |  | 2089-2090 |  | 2090-2091 |  | 2091-2092 |  | 2092-2093 |  | 2093-2094 |  | 2094-2095 |  | 2095-2096 |  | 2096-2097 |  | 2097-2098 |  | 2098-2099 |  | 2099-2100 |  | 2100-2101 |  | 2101-2102 |  | 2102-2103 |  | 2103-2104 |  | 2104-2105 |  | 2105-2106 |  | 2106-2107 |  | 2107-2108 |  | 2108-2109 |  | 2109-2110 |  | 2110-2111 |  | 2111-2112 |  | 2112-2113 |  | 2113-2114 |  | 2114-2115 |  | 2115-2116 |  | 2116-2117 |  | 2117-2118 |  | 2118-2119 |  | 2119-2120 |  | 2120-2121 |  | 2121-2122 |  | 2122-2123 |  | 2123-2124 |  | 2124-2125 |  | 2125-2126 |  | 2126-2127 |  | 2127-2128 |  | 2128-2129 |  | 2129-2130 |  | 2130-2131 |  | 2131-2132 |  | 2132-2133 |  | 2133-2134 |  | 2134-2135 |  | 2135-2136 |  | 2136-2137 |  | 2137-2138 |  | 2138-2139 |  | 2139-2140 |  | 2140-2141 |  | 2141-2142 |  | 2142-2143 |  | 2143-2144 |  | 2144-2145 |  | 2145-2146 |  | 2146-2147 |  | 2147-2148 |  | 2148-2149 |  | 2149-2150 |  | 2150-2151 |  | 2151-2152 |  | 2152-2153 |  | 2153-2154 |  | 2154-2155 |  | 2155-2156 |  | 2156-2157 |  | 2157-2158 |  | 2158-2159 |  | 2159-2160 |  | 2160-2161 |  | 2161-2162 |  | 2162-2163 |  | 2163-2164 |  | 2164-2165 |  | 2165-2166 |  | 2166-2167 |  | 2167-2168 |  | 2168-2169 |  | 2169-2170 |  | 2170-2171 |  | 2171-2172 |  | 2172-2173 |  | 2173-2174 |  | 2174-2175 |  | 2175-2176 |  | 2176-2177 |  | 2177-2178 |  | 2178-2179 |  | 2179-2180 |  | 2180-2181 |  | 2181-2182 |  | 2182-2183 |  | 2183-2184 |  | 2184-2185 |  | 2185-2186 |  | 2186-2187 |  | 2187-2188 |  | 2188-2189 |  | 2189-2190 |  | 2190-2191 |  | 2191-2192 |  | 2192-2193 |  | 2193-2194 |  | 2194-2195 |  | 2195-2196 |  | 2196-2197 |  | 2197-2198 |  | 2198-2199 |  | 2199-2200 |  | 2200-2201 |  | 2201-2202 |  | 2202-2203 |  | 2203-2204 |  | 2204-2205 |  | 2205-2206 |  |
|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|
|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|

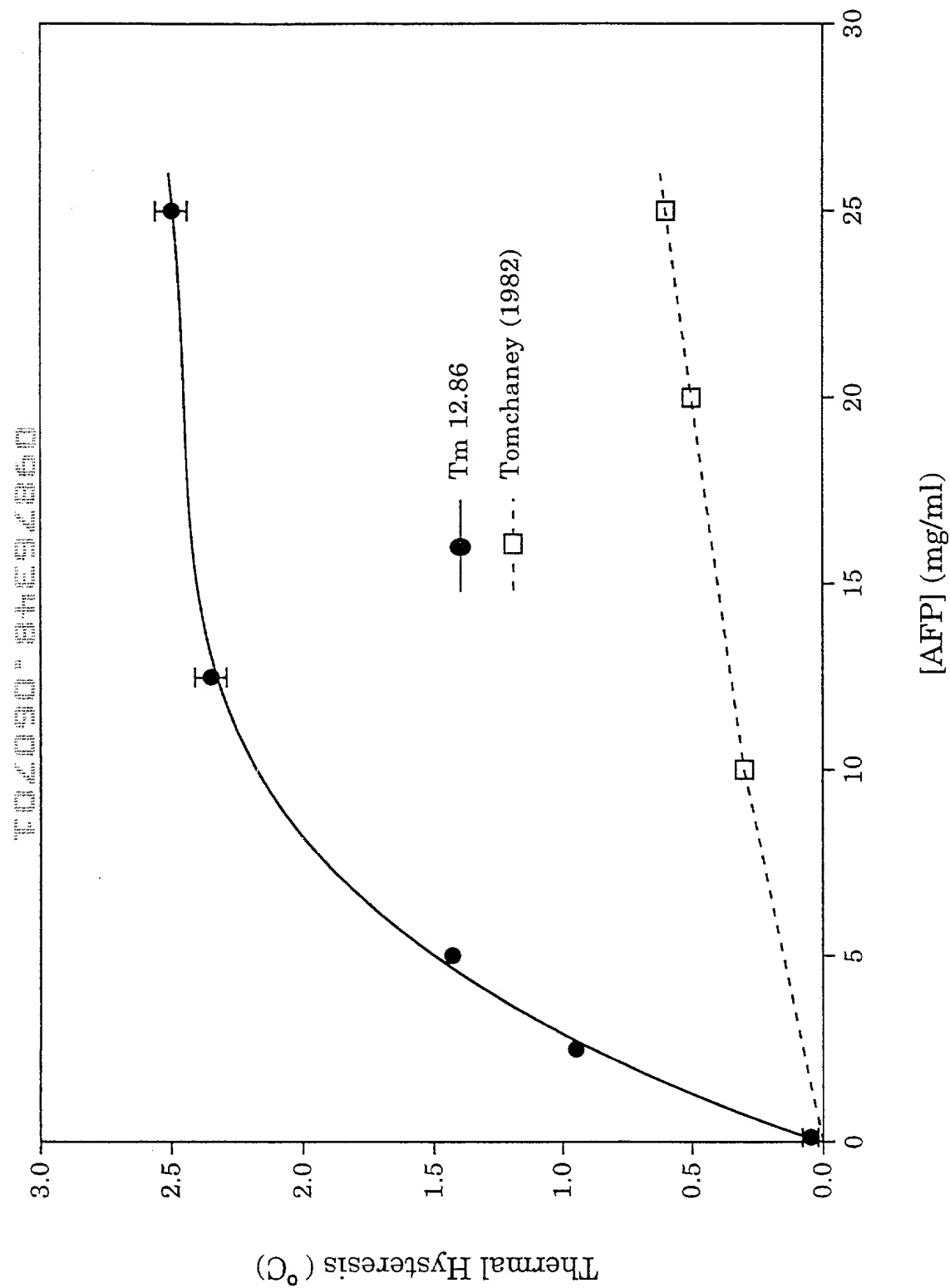


FIG 1.9

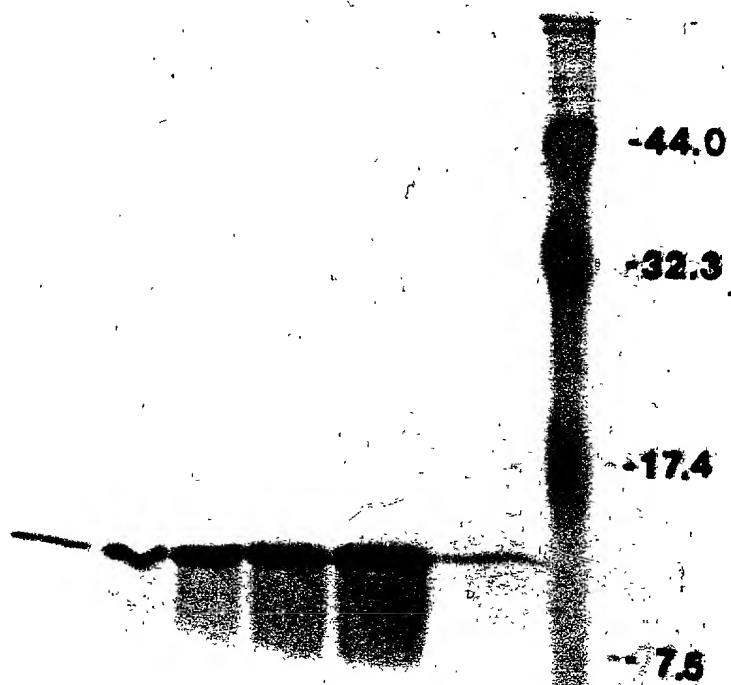


FIG 1.10

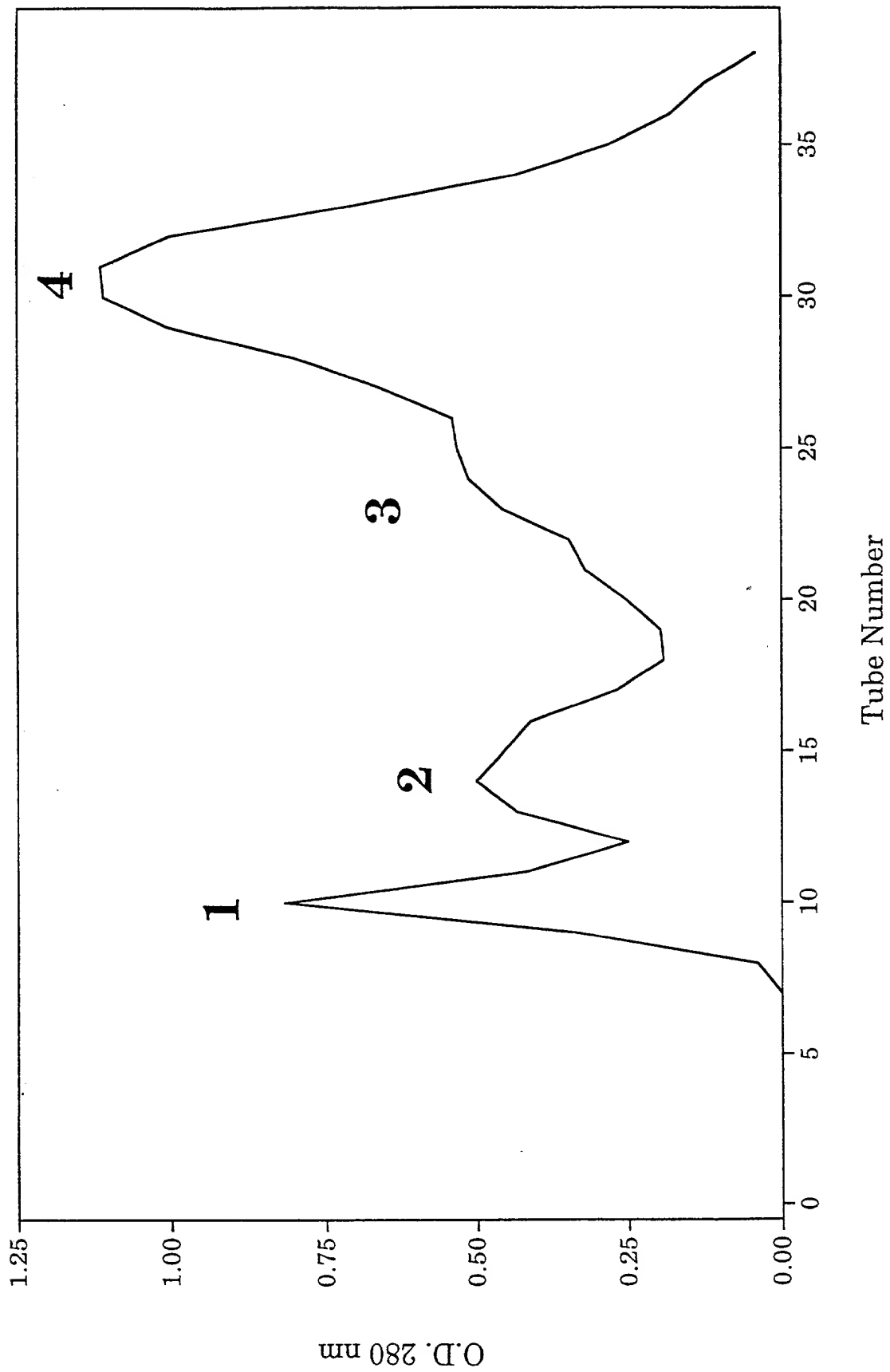


FIG 1.11

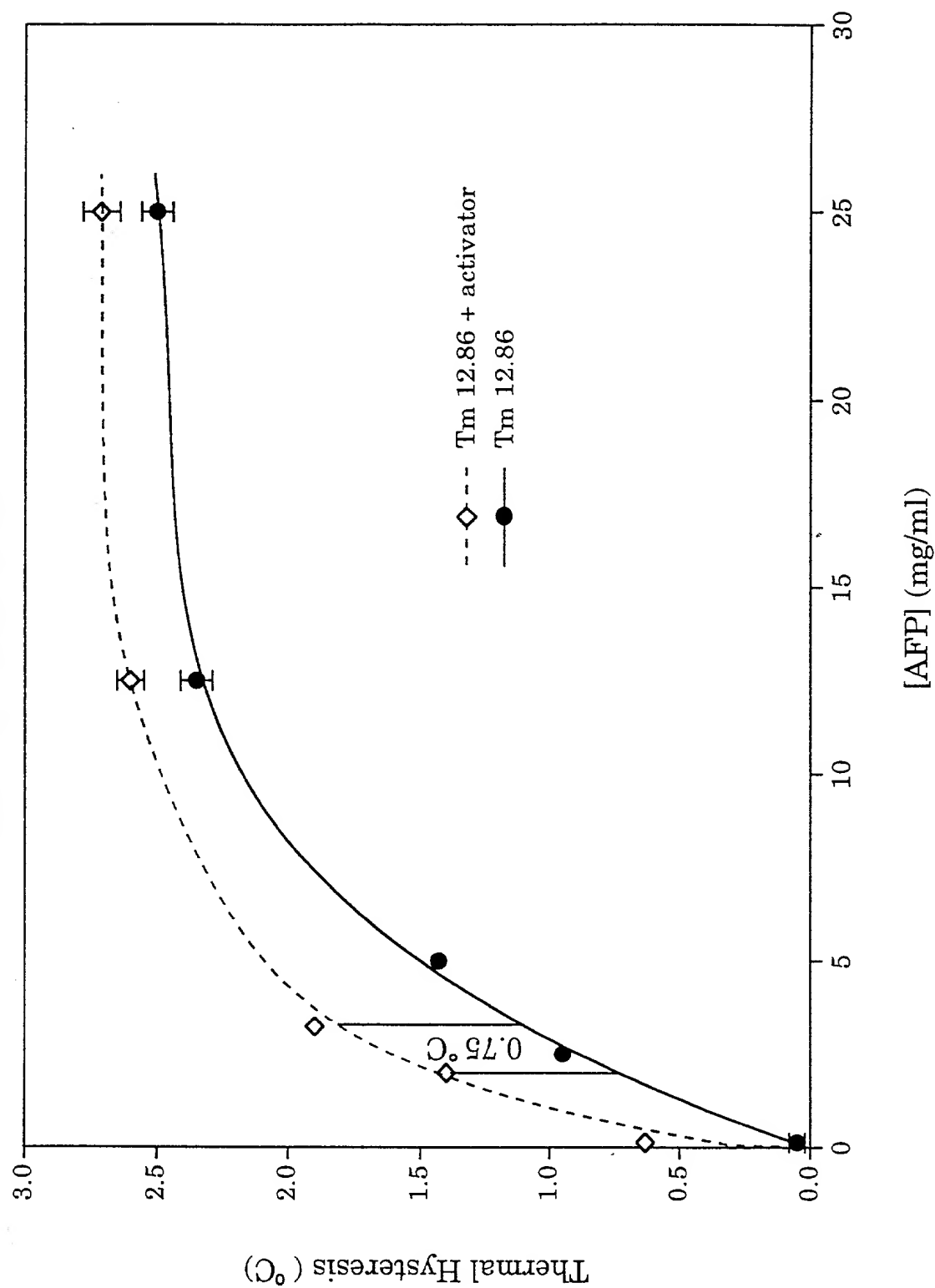


FIG 1.12

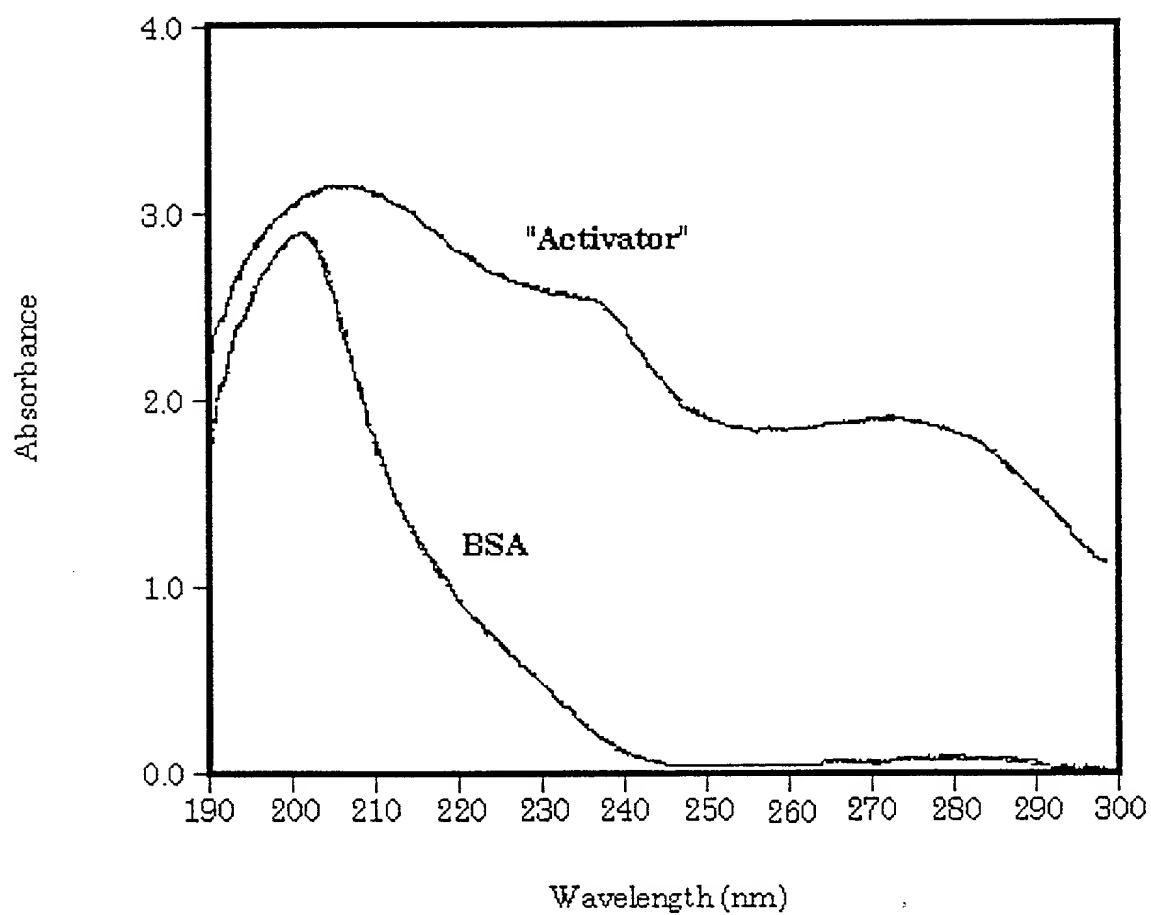


FIG 1.13

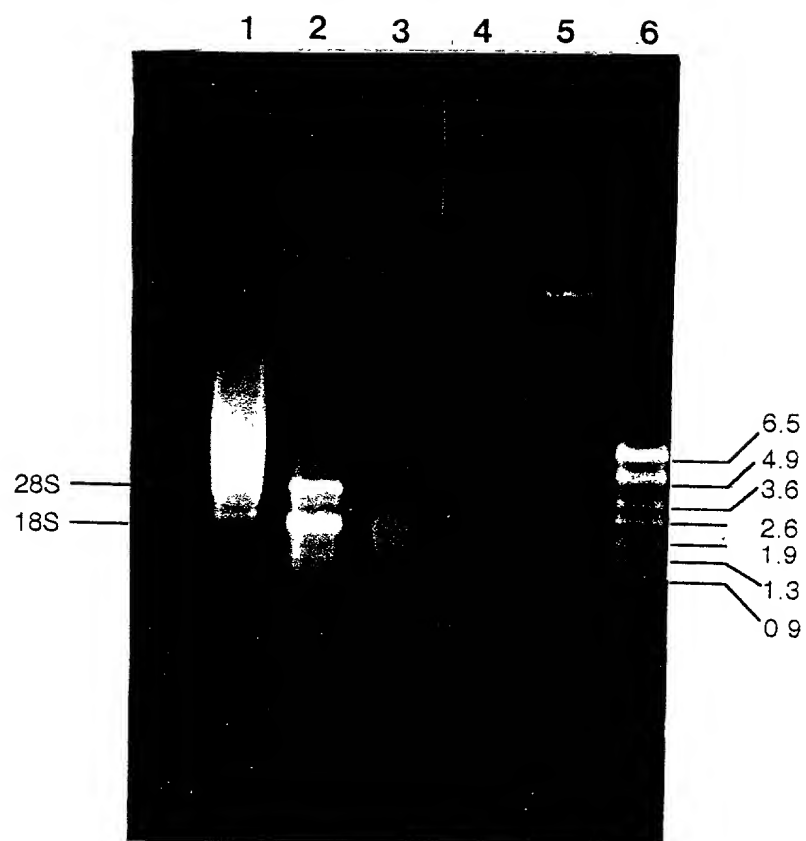


FIG 2.0

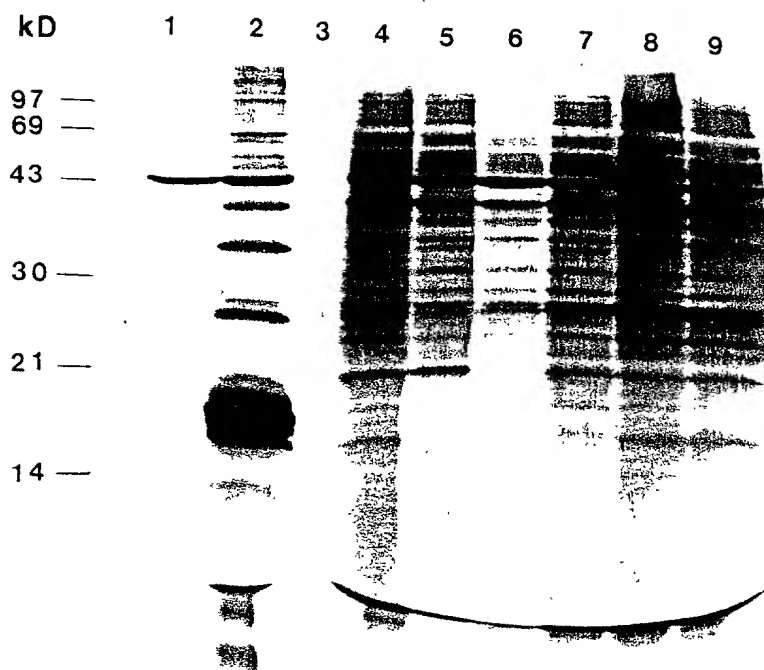


FIG 2.1

09076348.060701

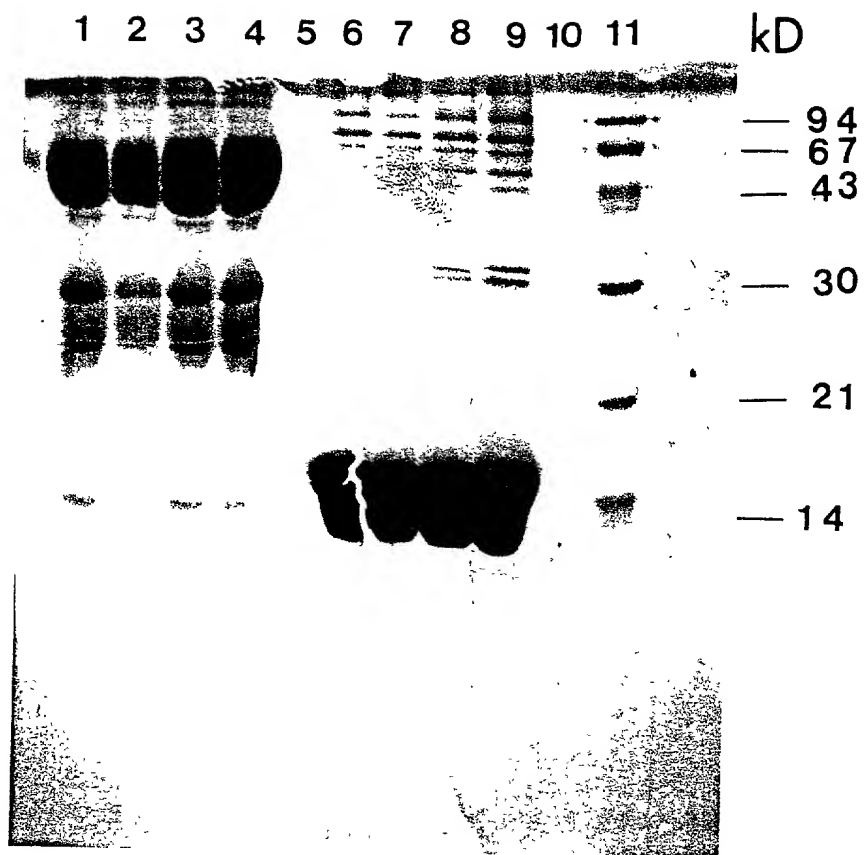


FIG 2.2

1 2 3 4 5 6 7 8 9

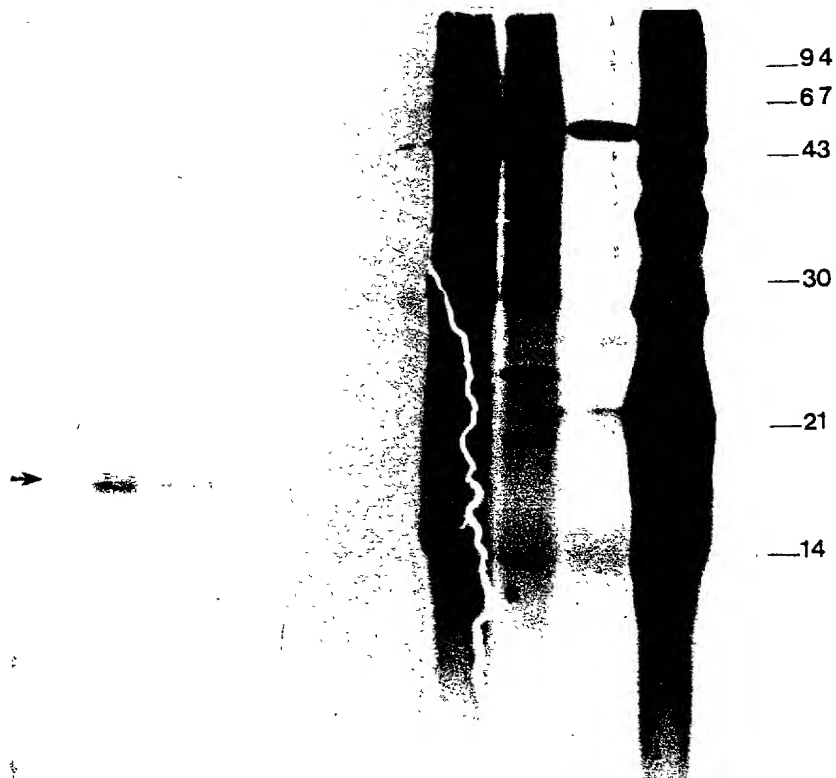


FIG 2.3

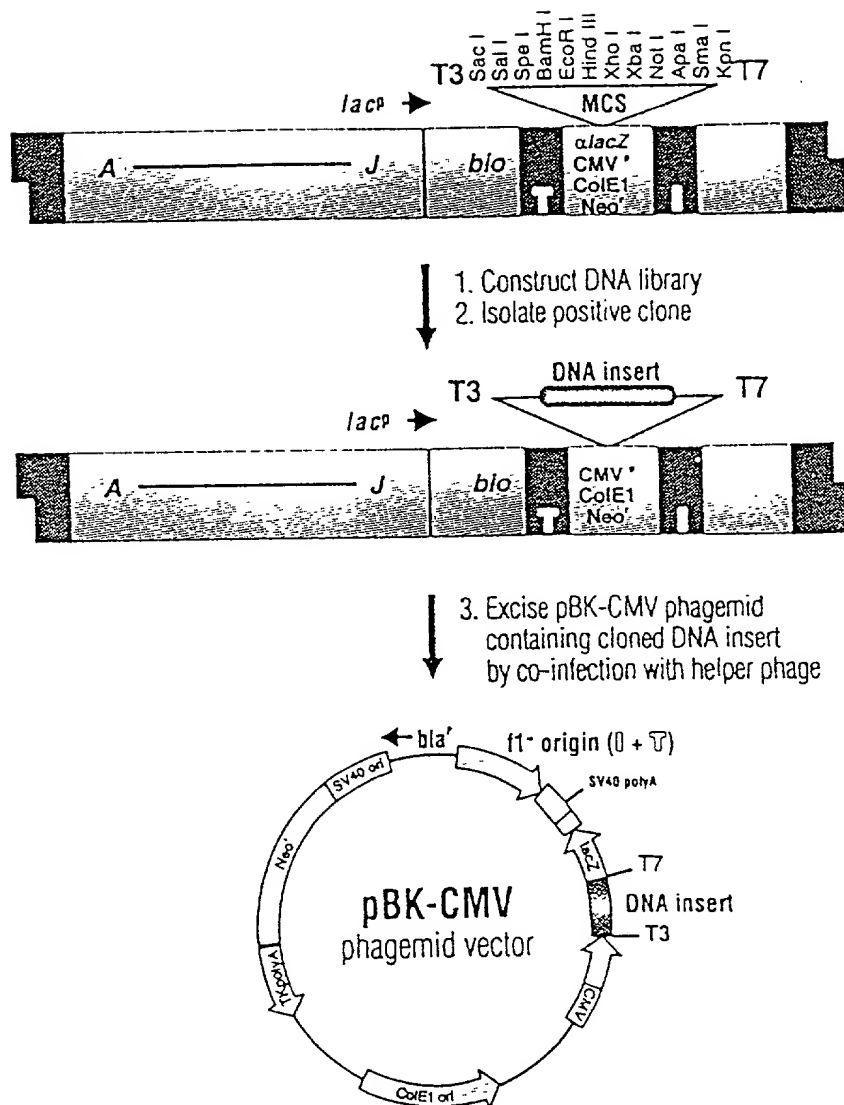


FIG. 2.4 a

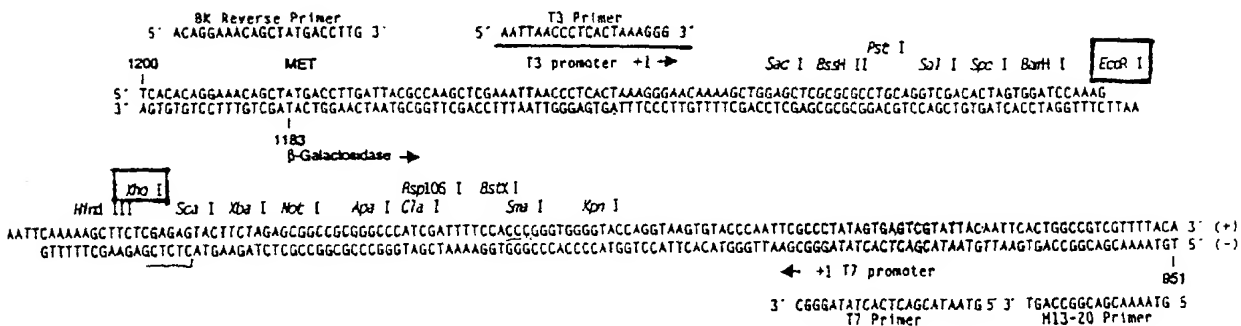
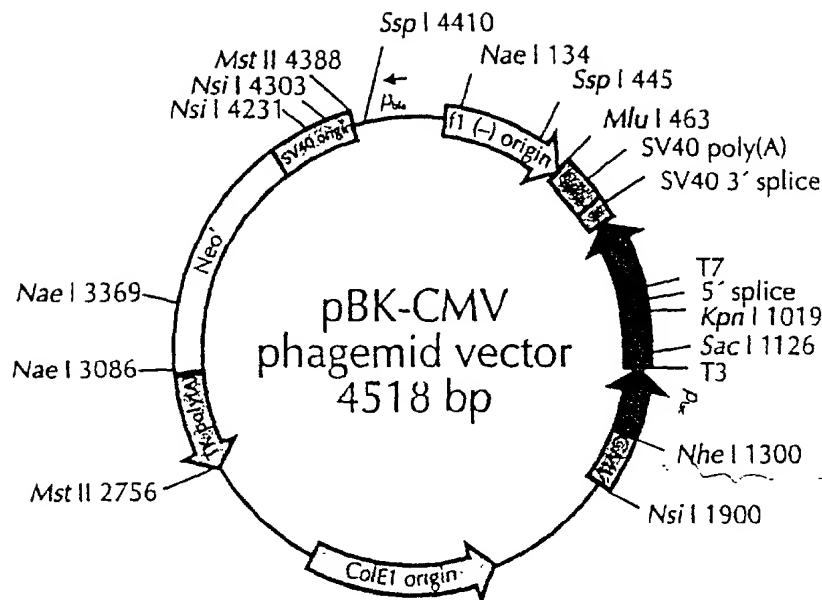


FIG. 2.4 b

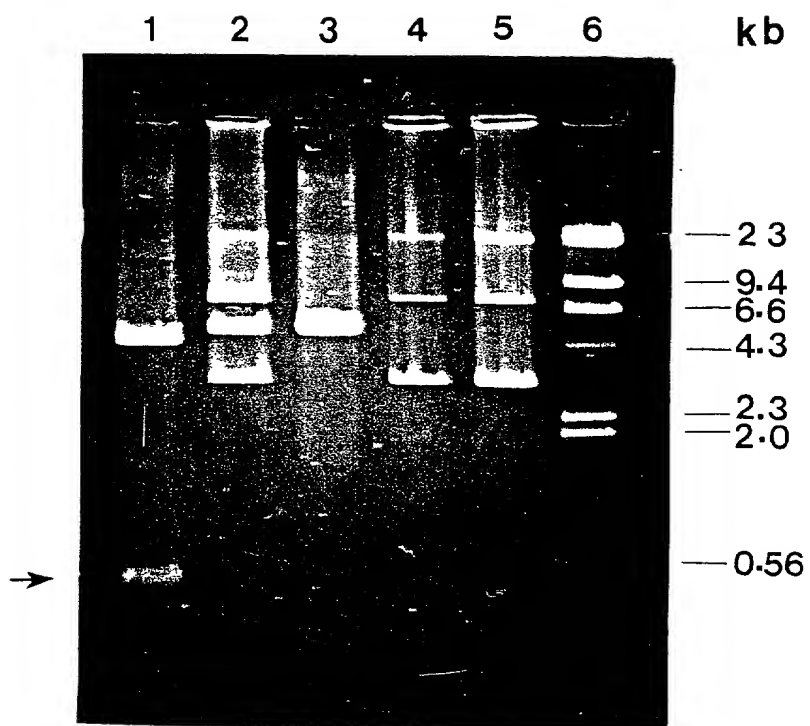


FIG 2.5

# DNA sequence of Tm 13.17 cDNA clone

|   |   |
|---|---|
| B | E |
| a | C |
| m | O |
| H | R |
| I | I |

1 AGTGGATCCAAAGAATTCGGCACGAGACTACTAAGATGAAGTTGCTCTGTTGTCTAATCT  
M K L L C C L I S

61 CCCTCATTCTGTTGGTCACAGTTCAGGCCCTGACCGAGGCACAAATTGAGAACTGAACA  
L I L L V T V Q A L T E A Q I E K L N K

121 AGATCAGCAAAAAATGTCAAAATGAAAGTGGAGTGTGCGCAAGAGATCATAACCAAAGCTC  
I S K K C Q N E S G V S Q E I I T K A R

181 GCAACGGTGACTGGGAGGACGATCCTAAACTGAAACGCCAAGTTTTTTCGCTGGCCAGGA  
N G D W E D D P K L K R Q V F C V A R N

241 ACGCCGGTCTGGCCACGGAATCGGGAGAGGTGGTGGTGCACGTGTTGAGGGAGAAGGTGA  
A G L A T E S G E V V V D V L R E K V R

301 GGAAGGTCACCTGACAACGACGAAGAACTGAGAAAATCATCAATAAGTGCGCCGTCAAGA  
K V T D N D E E T E K I I N K C A V K R

361 GAGATACTGTTGAAGAGACGGTGTTCATACTTTCAAATGTGTCATGAAAAACAAGCCAA  
D T V E E T V F N T F K C V M K N K P K

421 AGTTCTCACCAGTTGATTGAACCACCACGACTAGTAGATGGTTCAAATGGTGTGCTTTAC  
F S P V D \*

481 ATATAAAATAAAGTGTCTGATGTAAAAAATAAAAAAAAAAAAAAAAAAACTCG  
polyadenylation signal poly (A) tail (26)

537 AGAGTATTCTAGAGCGGCCGCGGGCCCATCGTTTTCCACCC

X  
h  
o  
I

FIG 2.6a

09076348-060704



FIG 2.6b

A. Mature Tm 13.17 amino acid residue

1 LTEAQIEKLN KISKKQNES GVSQEIIITKA RNGDWEDDPK LKRQVFCVAR  
51 NAGLATESGE VVDVLREKV RKVTDNDEET EKIINKCAVK RDTVEETVFN  
101 TFKCVMKNKP KFSPVD

B. Summary of the composition analysis for the mature Tm 13.17 sequence:

| <u>Residue</u> | <u>Number</u> | <u>Mole Percent</u> |
|----------------|---------------|---------------------|
| A = Ala        | 6             | 5.172               |
| B = Asx        | 0             | 0.000               |
| C = Cys        | 4             | 3.448               |
| D = Asp        | 8             | 6.897               |
| E = <b>Glu</b> | <b>13</b>     | <b>11.207</b>       |
| F = Phe        | 4             | 3.448               |
| G = Gly        | 4             | 3.448               |
| H = His        | 0             | 0.000               |
| I = Ile        | 6             | 5.172               |
| K = <b>Lys</b> | <b>16</b>     | <b>13.793</b>       |
| L = Leu        | 5             | 4.310               |
| M = Met        | 1             | 0.862               |
| N = Asn        | 8             | 6.897               |
| P = Pro        | 3             | 2.586               |
| Q = Gln        | 4             | 3.448               |
| R = Arg        | 6             | 5.172               |
| S = Ser        | 5             | 4.310               |
| T = Thr        | 8             | 6.897               |
| V = <b>Val</b> | <b>14</b>     | <b>12.069</b>       |
| W = Trp        | 1             | 0.862               |
| Y = Tyr        | 0             | 0.000               |
| Z = Glx        | 0             | 0.000               |

Molecular weight = 13171.96; Residues = 116; Average Residue Weight = 113.551

Charge = 1; Isoelectric point = 7.74.

FIG 2.6c



|          |     |   |     |
|----------|-----|---|-----|
| Tm 13.17 | 3   | EAQIEKLNKISKKCQNESGVSQEIITKARNGDWEDDPKLKRQVFCVARNA  | 52  |
|          |     | ..    ..  .  ..   ::  :..   :       :.  :..         |     |
| AFP-3    | 1   | ETPREKLKQHSDACKAESGVSEESLNKVRNREEVDDPKLKEHAF CILKRA | 50  |
| Tm 13.17 | 53  | GLATESGEVVVDVLREKVRKVTNDDEETEKIINKCAVKRDTVEETVFNTF  | 102 |
|          |     | : ..   . :  :: .:. :.. ..... ::   : ... :           |     |
| AFP-3    | 51  | GFIDASGEFQLDHIKTKFKENSEHPEKVDDLVAKCAVKKDTPQHSSADFF  | 100 |
| Tm 13.17 | 103 | KCVMKNKP  | 110 |
|          |     | . :.  |     |
| AFP-3    | 101 | KCVHDNRS  | 108 |

Percent identity: 39.8 (identical amino acids; Percent similarity: 58.3 (identical amino acids plus conservative amino acids).

FIG 2.8

096440-060704

Tm 13.17

AFP-3

B Protein

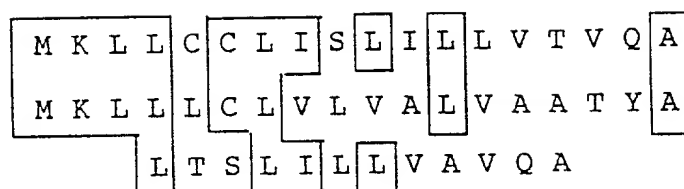


FIG 2.9

|          |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tm 13.17 | NH2 | L | T | E | A | Q | I | E | K | L | N | K | I | S | K | K | C | Q | N | E |
| Tm 12.86 | NH2 | L | T | D | E | Q | I | Q | K | R | N | K | I | S | K | E | ? | Q | Q | V |

FIG 2.10

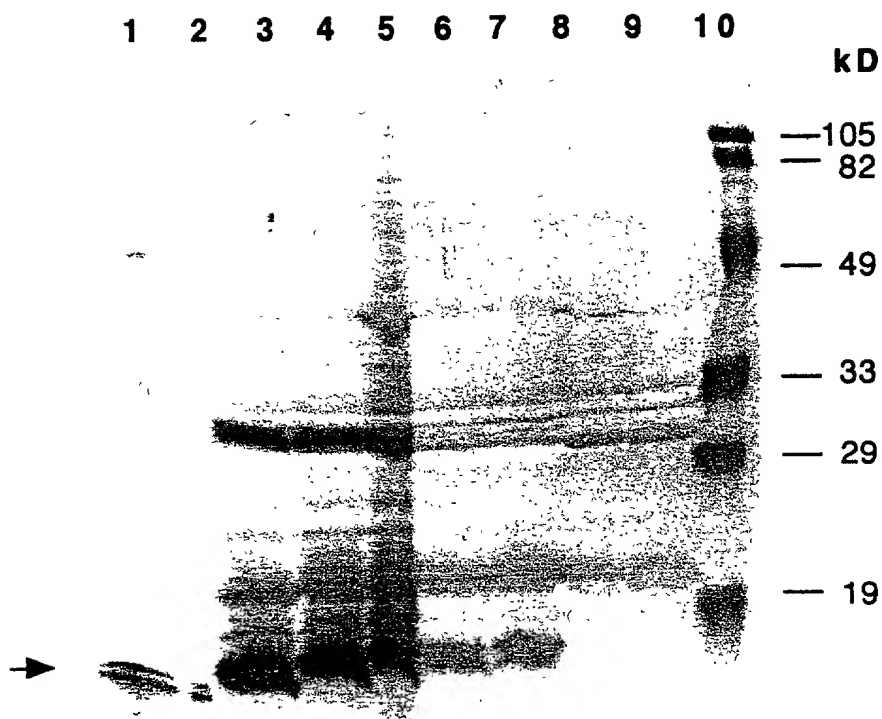


FIG 2.11



1 GGCACGAGCAAAAATGAAACTCCTCTTGTGCTTTGCGTTTCGCCGCC  
M K L L L C F A F A A

47 ATCGTCATCGGAGCTCAGGCTCTCACCGACGAACAGATACAGAAA  
I V I G A Q A L T D E Q I Q K

92 AGGAACAAGATCAGCAAAGAATGCCAGCAGGTGTCCGGAGTGTCC  
R N K I S K E C Q Q V S G V S

137 CAAGAGACGATCGACAAAGTCCGCACAGGTGTCTTGGTCGATGAT  
Q E T I D K V R T G V L V D D

182 CCCAAAATGAAGAAGCACGTCCTCTGCTTCTCGAAGAAAACCTGGA  
P K M K K H V L C F S K K T G

226 GTGGCAACCGAAGCCGGAGACACCAATGTGGAGGTACTCAAAGCC  
V A T E A G D T N V E V L K A

271 AAGCTGAAGCATGTGGCCAGCGACGAAGAGGTGGACAAGATCGTG  
K L K H V A S D E E V D K I V

316 CAGAAAGTGCGTGGTCAAGAAGGCCACACCAGAGGAAACGGCTTAT  
Q K C V V K K A T P E E T A Y

361 GACACCTTCAAGTGTATTTACGACAGCAAACCTGATTTCTCTCCT  
D T F K C I Y D S K P D F S P

406 ATTGATTAAATTGTTTTGTATTTGACTGAATTTTGACAATAAAGGT  
I D \*

451 ACTATCGTTATGTAAAAA

polyadenylation signal

poly (A) tail

FIG 3.0

1 GGCACGAGCAAAA ATGAAACTCCTCTTGTGCTTTGCTTTGCGCCGC  
M K L L L C F A F A A

47 ATCGTCATCGGAGCTCAGGCTCTCACCGACGAACAGATACAGAAA  
I V I G A Q A L T D E Q I Q K

92 AGGAACAAGATCAGCAAAGAATGCCAGCAGGTGTCCGGAGTGTCC  
R N K I S K E C Q Q V S G V S

137 CAAGAGACGATCGACAAAGTCCGCACAGGTGTCTTGGTCGACGAT  
Q E T I D K V R T G V L V D D

182 CCCAAAATGAAGAAGCACGTCCTCTGCTTCTCGAAGAAAACCTGGA  
P K M K K H V L C F S K K T G

226 GTGGCAACCGAAGCCGGAGACACCAATGTGGAGGTACTCAAAGCC  
V A T E A G D T N V E V L K A

271 AAGCTGAAGCATGTGGCCAGCGACGAAGAAGTGGACAAGATCGTG  
K L K H V A S D E E V D K I V

316 CAGAAGTGCGTGGTCAAGAAGGCCACACCAGAGGAAACGGCTTAT  
Q K C V V K K A T P E E T A Y

361 GACACCTTCAAGTGTATTTACGACAGTAAACCTGATTTCTCTCCT  
D T F K C I Y D S K P D F S P

406 ATTGATTAAATTGTTTTGTATTTGACTGAATTTTGACAATAAAGGT  
I D \*

polyadenylation signal

451 ACTATCGTTATGAAAAAAAAAAAAAAAAAAAA

poly (A) tail

FIG 3.1

start



|     |   |   |
|-----|---|---|
| 2-2 | G G C A C G A G C A A A A A T G A A A C T C C T C T T G T G C T T T G C   | G |
| 2-3 | G G C A C G A G C A A A A A T G A A A C T C C T C T T G T G C T T T G C   | T |
| 2-2 | T T C G C C G C C A T C G T C A T C G G A G C T C A G G C T C T C A C C G |   |
| 2-3 | T T C G C C G C C A T C G T C A T C G G A G C T C A G G C T C T C A C C G |   |
| 2-2 | A C G A A C A G A T A C A G A A A A G G A A C A A G A T C A G C A A A G A |   |
| 2-3 | A C G A A C A G A T A C A G A A A A G G A A C A A G A T C A G C A A A G A |   |
| 2-2 | A T G C C A G C A G G T G T C C G G A G T G T C C C A A G A G A C G A T C |   |
| 2-3 | A T G C C A G C A G G T G T C C G G A G T G T C C C A A G A G A C G A T C |   |
| 2-2 | G A C A A A G T C C G C A C A G G T G T C T T G G T C G A                 | T |
| 2-3 | G A C A A A G T C C G C A C A G G T G T C T T G G T C G A                 | C |
| 2-2 | A A A T G A A G A A G C A C G T C C T C T G C T T C T C G A A G A A A A C |   |
| 2-3 | A A A T G A A G A A G C A C G T C C T C T G C T T C T C G A A G A A A A C |   |
| 2-2 | T G G A G T G G C A A C C G A A G C C G G A G A C A C C A A T G T G G A G |   |
| 2-3 | T G G A G T G G C A A C C G A A G C C G G A G A C A C C A A T G T G G A G |   |
| 2-2 | G T A C T C A A A G C C A A G C T G A A G C A T G T G G C C A G C G A C G |   |
| 2-3 | G T A C T C A A A G C C A A G C T G A A G C A T G T G G C C A G C G A C G |   |
| 2-2 | A A G A   | G |
| 2-3 | A A G A   | A |
| 2-2 | G A A G G C C A C A C C A G A G G A A A C G G C T T A T G A C A C C T T C |   |
| 2-3 | G A A G G C C A C A C C A G A G G A A A C G G C T T A T G A C A C C T T C |   |
| 2-2 | A A G T G T A T T T A C G A C A G   | C |
| 2-3 | A A G T G T A T T T A C G A C A G   | T |
| 2-2 | T T G A T T A A T T G T T T T G T A T T T G A C T G A A T T T T G A C A A |   |
| 2-3 | T T G A T T A A T T G T T T T G T A T T T G A C T G A A T T T T G A C A A |   |
| 2-2 | T A A A G G T A   | A |
| 2-3 | T A A A G G T A   | C |

FIG 3.2

Composition of 2-2 and 2-3

| Analysis                     | Whole Protein |
|------------------------------|---------------|
| Molecular Weight             | 12843.80 m.w. |
| Length                       | 115           |
| 1 microgram =                | 77.859 pMoles |
| Molar Extinction coefficient | 3040±5%       |
| 1 A(280) =                   | 4.22 mg/ml    |
| Isoelectric Point            | 7.11          |
| Charge at pH 7               | 0.13          |

Whole Protein Composition Analysis

| Amino Acid(s)        | Number count | % by weight | % by frequency |
|----------------------|--------------|-------------|----------------|
| Charged (RKHYCDE)    | 48           | 47.19       | 41.74          |
| Acidic (DE)          | 20           | 18.90       | 17.39          |
| Basic (KR)           | 20           | 20.40       | 17.39          |
| Polar (NCQSTY)       | 30           | 25.35       | 26.09          |
| Hydrophobic (AILFWV) | 34           | 27.26       | 29.57          |
| A Ala                | 6            | 3.32        | 5.22           |
| C Cys                | 4            | 3.21        | 3.48           |
| D Asp                | 11           | 9.86        | 9.57           |
| E Glu                | 9            | 9.05        | 7.83           |
| F Phe                | 3            | 3.44        | 2.61           |
| G Gly                | 4            | 1.78        | 3.48           |
| H His                | 2            | 2.14        | 1.74           |
| I Ile                | 6            | 5.29        | 5.22           |
| K Lys                | 18           | 17.97       | 15.65          |
| L Leu                | 5            | 4.41        | 4.35           |
| M Met                | 1            | 1.02        | 0.87           |
| N Asn                | 2            | 1.78        | 1.74           |
| P Pro                | 4            | 3.02        | 3.48           |
| Q Gln                | 6            | 5.98        | 5.22           |
| R Arg                | 2            | 2.43        | 1.74           |
| S Ser                | 7            | 4.75        | 6.09           |
| T Thr                | 9            | 7.08        | 7.83           |
| V Val                | 14           | 10.80       | 12.17          |
| W Trp                | 0            | 0.00        | 0.00           |
| Y Tyr                | 2            | 2.54        | 1.74           |
| B Asx                | 0            | 0.00        | 0.00           |
| Z Glx                | 0            | 0.00        | 0.00           |
| X Xxx                | 0            | 0.00        | 0.00           |
| . Ter                | 0            | 0.00        | 0.00           |

FIG 3.3

09676340-060704

FD-2090-8429850

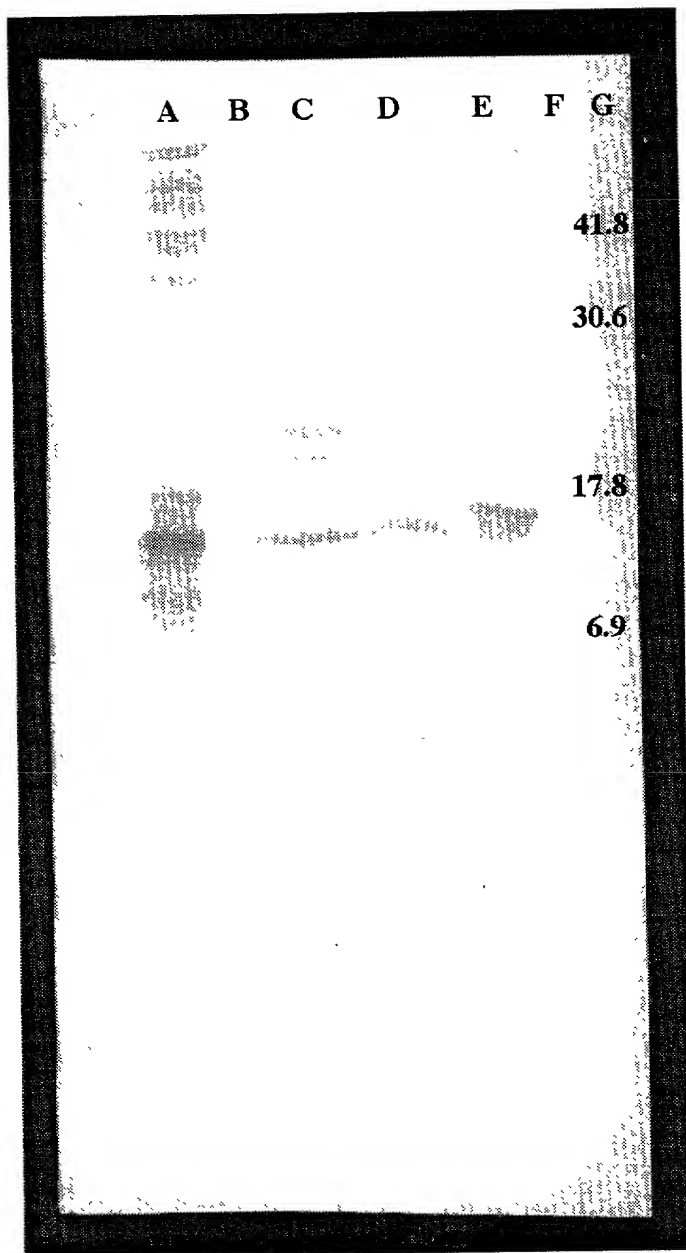


FIG 3.4

09876349-050701  
T02050-84E9Z860

Lane

1 2 3 4 5

a →  
b →

577 bp  
483 bp

FIG 4.0

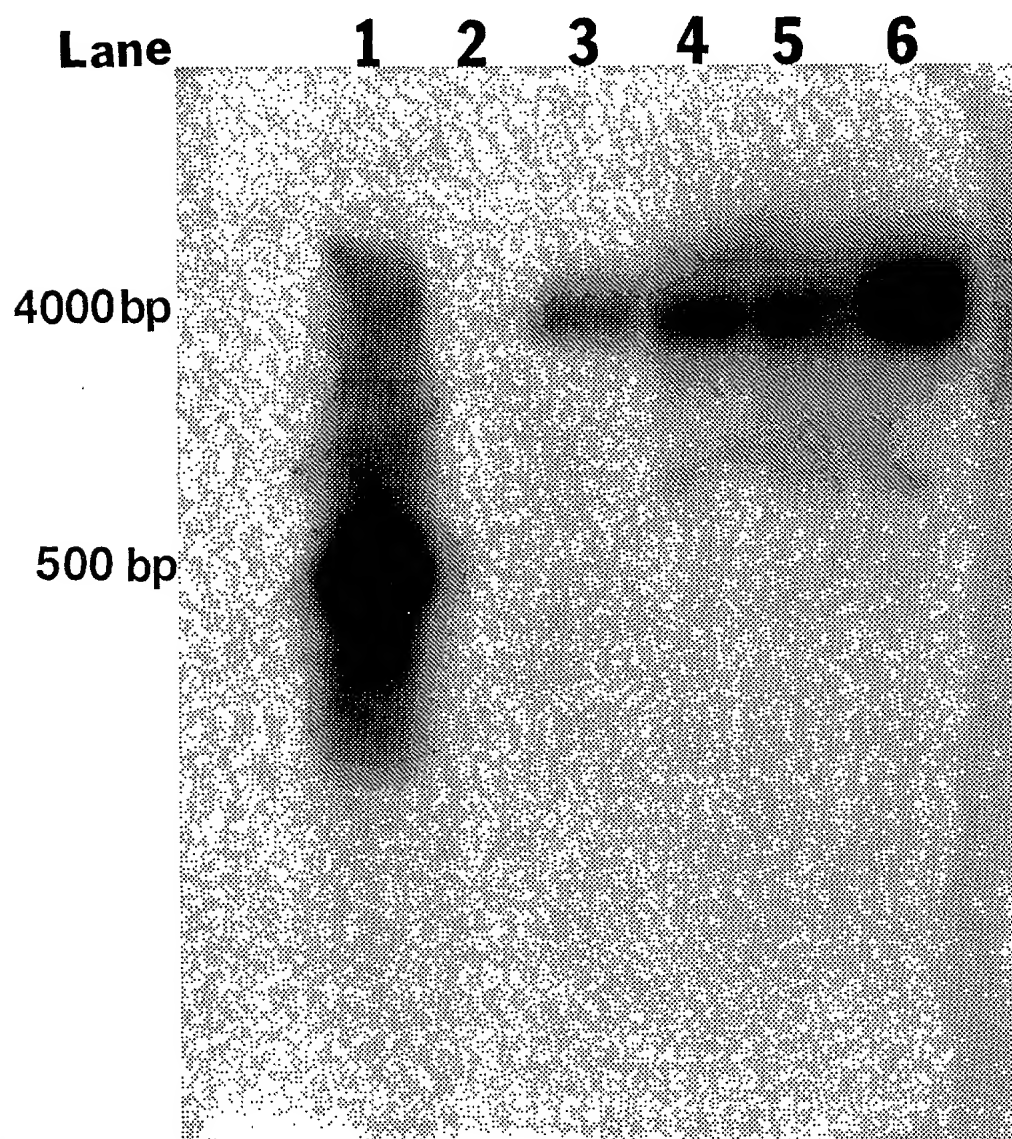


FIG 4.1

09876348-060701

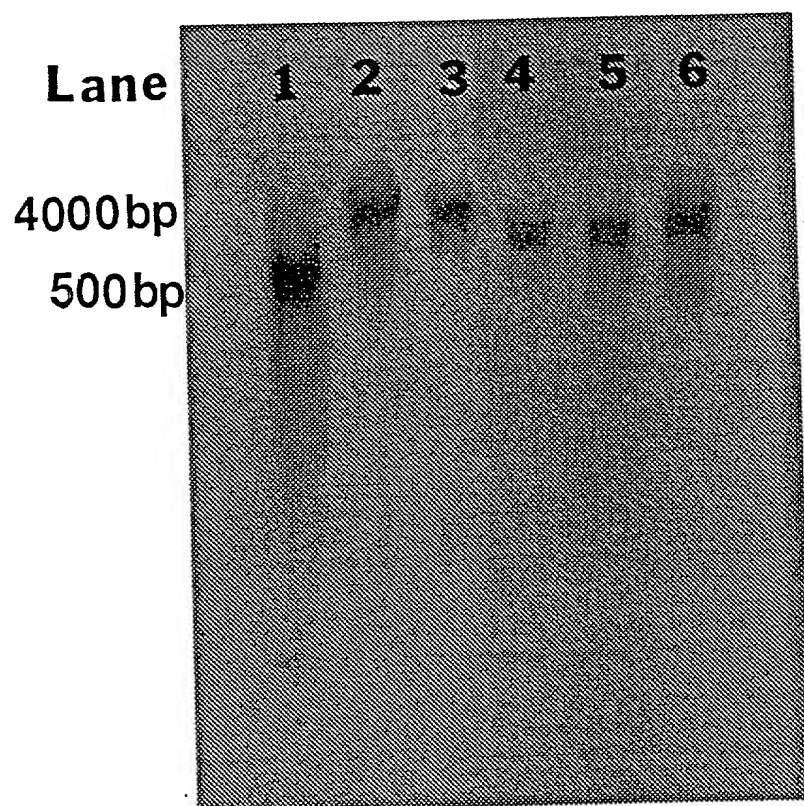
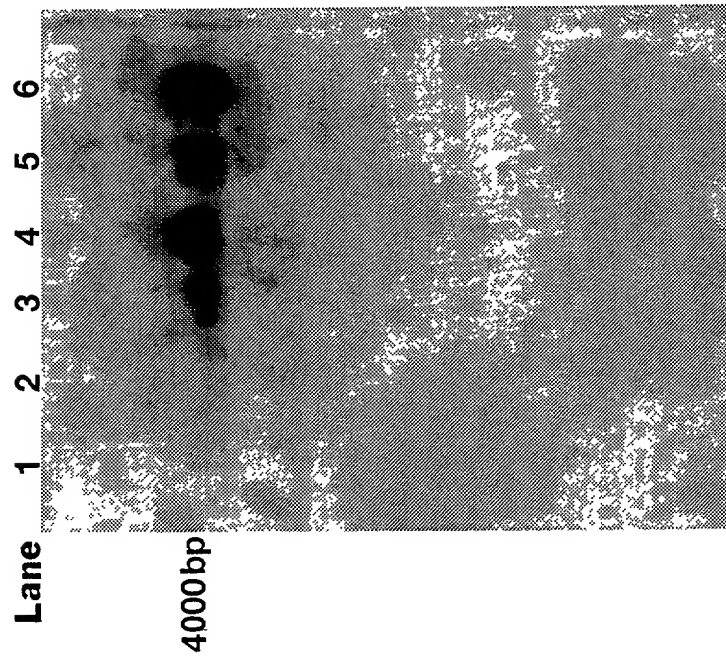


FIG 4.2

A.



B.

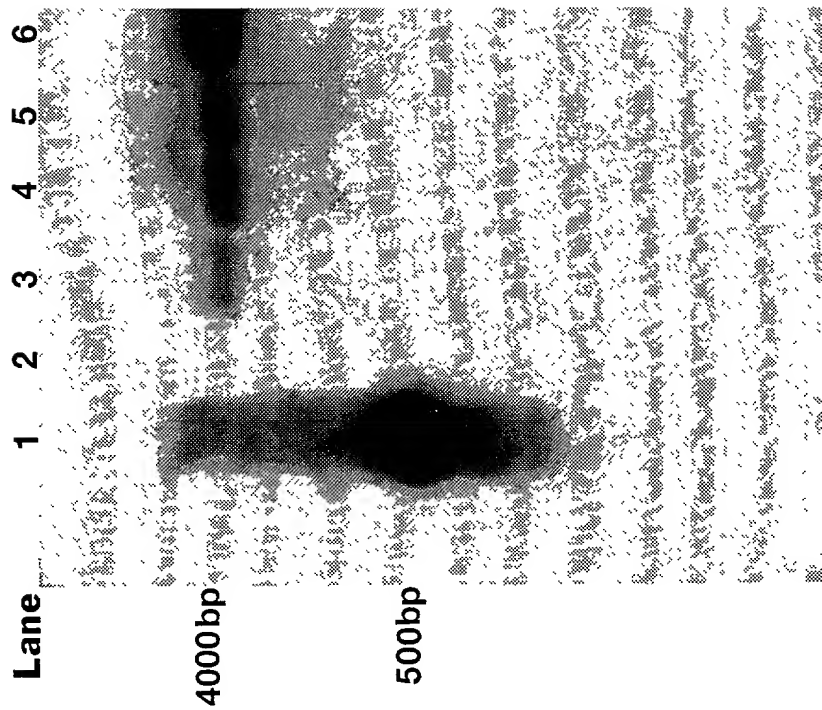


FIG 4.3

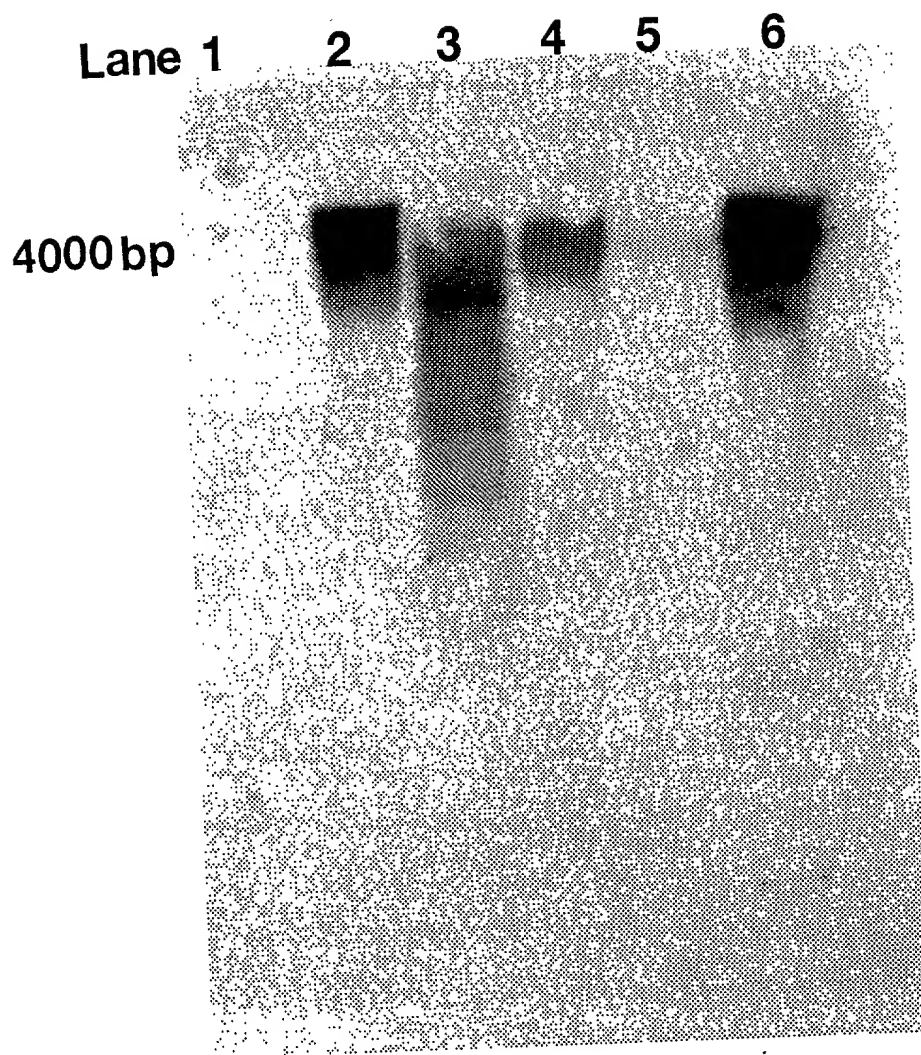
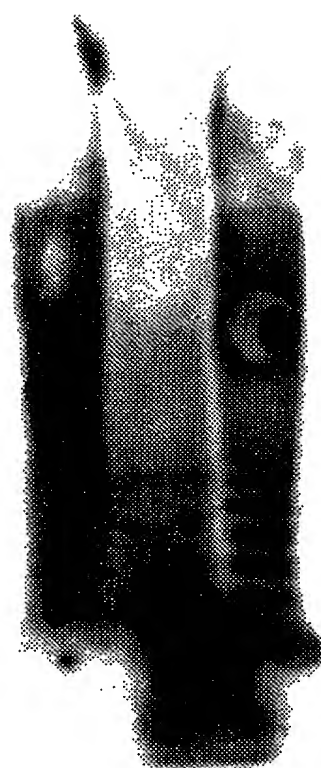


FIG 4.4

09876348-060704  
FD-2090-07C92860

Lane            1        2        3        4        5



23130

9416

4361

2322

2027

564

FIG 4.5

# Tm 13.17 cDNA

1 AGTGGATCCAAAGAATTCGGCAGGAGACTACTAAGATGAAGTTGCTCTGTTGTCTAATCT  
M K L L C C L I S

61 CCCTCATTCTGTTGGTCACAGTTCAGGCCCTGACCGAGGCACAAATTGAGAACTGAACA  
L I L L V T V Q A L T E A Q I E K L N K  
↑ Forward Primer

121 AGATCAGCAAAAAATGTCAAAATGAAAGTGGAGTGTGCAAGAGATCATAACCAAAGCTC  
I S K K C Q N E S G V S Q E I I T K A R

181 GCAACGGTGACTGGGAGGACGATCCTAAACTGAAACGCCAAGTTTTTTCGTGGCCAGGA  
N G D W E D D P K L K R Q V F C V A R N

241 ACGCCGGTCTGGCCACGGAATCGGGAGAGGTGGTGGTTCGACGTGTTGAGGGAGAAGGTGA  
A G L A T E S G E V V V D V L R E K V R

301 GGAAGGTCACTGACAACGACGAAGAACTGAGAAAATCATCAATAAGTGCGCCGTCAAGA  
K V T D N D E E T E K I I N K C A V K R  
Reverse Primer

361 GAGATACTGTTGAAGAGACGGTGTTCATACTTTCAAATGTGTCATGAAAAACAAGCCAA  
D T V E E T V F N T F K C V M K N K P K

421 AGTTCTCACCAGTTGATTGAACCACCAGACTAGTAGATGGTTCAAATGGTGTGCTTTAC  
F S P V D \*

481 ATATAAAATAAAGTGTTTCTGATGTAAAAAATAAAAAAAAAAAAAAAAAAACTC

FIG. 4.6 a

**B.**

Forward Primer

|          |                      |   |              |
|----------|----------------------|---|--------------|
| 2-2      | LTDEQIQKRNKISKECQQVS | <span style="border: 1px solid black;">GVSQE</span> | TI DKVRTGVLV |
| Tm 13.17 | LTEAQIEKLNKISKKCQNES | <span style="border: 1px solid black;">GVSQE</span> | II TKARNGDWE |
| B2       | LTEEDLQLLRQTSAECKTES | <span style="border: 1px solid black;">GASEA</span> | VI KKARKGDLE |
| AFP-3    | ETPREKLKQHSDACKAES   | <span style="border: 1px solid black;">GVSEE</span> | SLNKVRNREEV  |

|          |                                      |
|----------|--------------------------------------|
| 2-2      | DDPKMKKHVLCFSKKTGVATEAGDTNVEVLKAKLKH |
| Tm 13.17 | DDPKLKRQVFCVARNAGLATESGEVVVDVLREKVRK |
| B2       | DDPKLKMQLLCIFKALEIVAESGEIEADTFKEKLTR |
| AFP-3    | DDPKLKEHAFCLKRAGFIDASGEFQLDHIKTKFKE  |

Reverse Primer

|          |                       |  |              |
|----------|-----------------------|--|--------------|
| 2-2      | VAS DEEVDKI VQKCVVKK  | <span style="border: 1px solid black;">ATPEET</span> | AYDTFKCI YDS |
| Tm 13.17 | VTDNDEETEKI I NKCAVKR | <span style="border: 1px solid black;">DTVEET</span> | VFNTFKCVMKN  |
| B2       | VTNDDEESEKI VEKCTVTE  | <span style="border: 1px solid black;">DTPEDT</span> | AFEVTKCVLKD  |
| AFP-3    | NSEHPEKVDDLVAKCAVKK   | <span style="border: 1px solid black;">DTPQHS</span> | SADFFKCVHDN  |

|          |            |
|----------|------------|
| 2-2      | KPDFSPID   |
| Tm 13.17 | KPKFSPVD   |
| B2       | KPNFFGDLFV |
| AFP-3    | RS         |

**C.**

percent % composition

| Primer  | A    | C    | G    | T    | Melting Temperature(°C) |
|---------|------|------|------|------|-------------------------|
| Forward | 28.6 | 14.3 | 42.9 | 14.3 | 44.0                    |
| Reverse | 25.0 | 31.3 | 6.3  | 37.5 | 44.0                    |

FIG 4.6

T04090" 84E92860

3600 bp

**3600 bp**

090718-060748

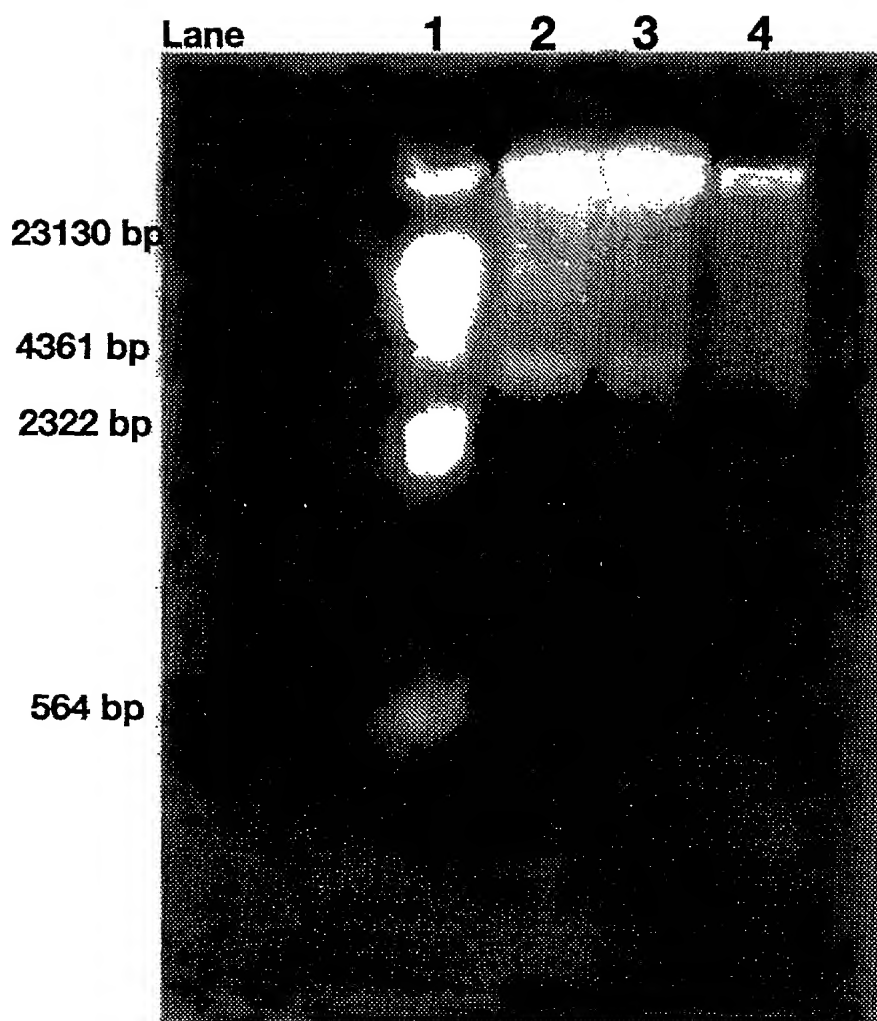
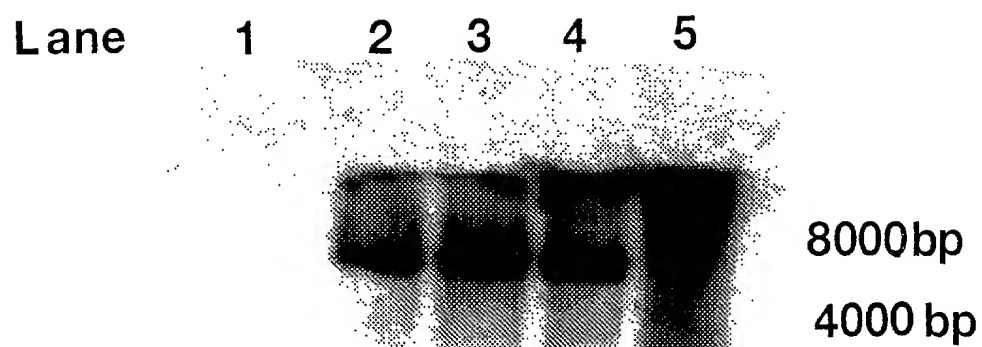


FIG 4.8



**FIG 4.9**

1 GGCACGAGCAAAA ATGAAACTCCTCTTGTGCTTTGCTTTGCGCGCC  
M K L L L C F A F A A

47 ATCGTCATCGGAGCTCAGGCTCTCACCGACGAACAGATACAGAAA  
I V I G A Q A L T D E Q I Q K

92 AGGAACAAGATCAGCAAAGAATGCCAGCAGGTGTCCGGAGTGTCC  
R N K I S K E C Q Q V S G V S

137 CAAGAGACGATCGACAAAGTCCGCACAGGTGTCTTGGTCGACGAT  
Q E T I D K V R T G V L V D D

182 CCCAAAATGAAGAAGCACGTCCTCTGCTTCTCGAAGAAAACCTGGA  
P K M K K H V L C F S K K T G

226 GTGGCAACCGAAGCCGGAGACACCAATGTGGAGGTACTCAAAGCC  
V A T E A G D T N V E V L K A

271 AAGCTGAAGCATGTGGCCAGCGACGAAGAGGTGGACAAGATCGTG  
K L K H V A S D E E V D K I V

316 CAGAAGTGCGTGGTCAAGAAGGCCACACCAGAGGAAACGGCTTAT  
Q K C V V K K A T P E E T A Y

361 GACACCTTCAAGGTTATTTACGACAGTAAACCTGATTTCTCTCCT  
D T F K V I Y D S K P D F S P

406 ATTGATTAAATTGTTTTGTATTTGACTGAATTTTGACAATAAAGGT  
I D \* CAATAAAGGT

451 ACTATCGTTATGTAAAAA polyadenylation signal

poly (A) tail

FIG. 4.10 a

| Analysis                     | Whole Protein |
|------------------------------|---------------|
| Molecular Weight             | 12839.70 m.w. |
| Length                       | 115           |
| 1 microgram =                | 77.883 pMoles |
| Molar Extinction coefficient | 2920±5%       |
| 1 A(280) =                   | 4.40 mg/ml    |
| Isoelectric Point            | 7.14          |
| Charge at pH 7               | 0.16          |

Predicted Amino Acid

Composition of 3-4

Whole Protein Composition Analysis

| Amino Acid(s)        | Number count | % by weight | % by frequency |
|----------------------|--------------|-------------|----------------|
| Charged (RKHYCDE)    | 47           | 46.41       | 40.87          |
| Acidic (DE)          | 20           | 18.91       | 17.39          |
| Basic (KR)           | 20           | 20.41       | 17.39          |
| Polar (NCQSTY)       | 29           | 24.55       | 25.22          |
| Hydrophobic (AILFWV) | 35           | 28.04       | 30.43          |
| A Ala                | 6            | 3.32        | 5.22           |
| C Cys                | 3            | 2.41        | 2.61           |
| D Asp                | 11           | 9.86        | 9.57           |
| E Glu                | 9            | 9.05        | 7.83           |
| F Phe                | 3            | 3.44        | 2.61           |
| G Gly                | 4            | 1.78        | 3.48           |
| H His                | 2            | 2.14        | 1.74           |
| I Ile                | 6            | 5.29        | 5.22           |
| K Lys                | 18           | 17.97       | 15.65          |
| L Leu                | 5            | 4.41        | 4.35           |
| M Met                | 1            | 1.02        | 0.87           |
| N Asn                | 2            | 1.78        | 1.74           |
| P Pro                | 4            | 3.02        | 3.48           |
| Q Gln                | 6            | 5.99        | 5.22           |
| R Arg                | 2            | 2.43        | 1.74           |
| S Ser                | 7            | 4.75        | 6.09           |
| T Thr                | 9            | 7.09        | 7.83           |
| V Val                | 15           | 11.58       | 13.04          |
| W Trp                | 0            | 0.00        | 0.00           |
| Y Tyr                | 2            | 2.54        | 1.74           |
| B Asx                | 0            | 0.00        | 0.00           |
| Z Glx                | 0            | 0.00        | 0.00           |
| X Xxx                | 0            | 0.00        | 0.00           |
| . Ter                | 0            | 0.00        | 0.00           |

FIG. 4.10 b

TOP SECRET

1 GGCACGAGCAAAA ATGAAACTCCTCTTGTGCTTTGCTTTTCGCCGCC  
M K L L L C F A F A A

47 ATCGTCATCGGAGCTCAGGCTCTCACCGATGAACAGATACAGAAA  
I V I G A Q A L T D E Q I Q K

92 AGGAACAAGATCAGCAAAGAATGCCAGCAGGAGTCCGGAGTGTCC  
R N K I S K E C Q Q E S G V S

137 CAAGAGACGATCGACAAAGTCCGCACAGGTGTCTTGGTCGACGAT  
Q E T I D K V R T G V L V D D

182 CCCAAAATGAAGAAGCACGTCCTCTGCTTCTCGAAGAGAACTGGA  
P K M K K H V L C F S K R T G

226 GTGGCAACCGAAGCCGGAGACACCAATGTGGAGGTACTCAAAGCC  
V A T E A G D T N V E V L K A

271 AAGCTGAAGCATGTGGCCAGCGACGAAGAAGTGGACAAGATCGTG  
K L K H V A S D E E V D K I V

316 CAGAAGTGCGTGGTCAAGAAGGCCACACCAGAGGAAACGGCTTAT  
Q K C V V K K A T P E E T A Y

361 GACACCTTCAAGTGTATTTACGACAGTAAACCTGATTTCTCTCCT  
D T F K V I Y D S K P D F S P

406 ATTGATTAAATTGTTTTGTATTTGACTGAATTTTGACAATAAAGGT  
I D \*  
polyadenylation signal

451 ACTATCGTTATGAAAAAAAAAAAAAAAAAAAA

poly (A) tail

FIG. 4.11 a

| Analysis                     | Whole Protein |
|------------------------------|---------------|
| Molecular Weight             | 12871.80 m.w. |
| Length                       | 115           |
| 1 microgram =                | 77.689 pMoles |
| Molar Extinction coefficient | 3040±5%       |
| 1 A(280) =                   | 4.23 mg/ml    |
| Isoelectric Point            | 7.11          |
| Charge at pH 7               | 0.13          |

## Whole Protein Composition Analysis

| Amino Acid(s)        | Number<br>count | % by<br>weight | % by<br>frequency |
|----------------------|-----------------|----------------|-------------------|
| Charged (RKHYCDE)    | 48              | 47.31          | 41.74             |
| Acidic (DE)          | 20              | 18.86          | 17.39             |
| Basic (KR)           | 20              | 20.57          | 17.39             |
| Polar (NCQSTY)       | 30              | 25.29          | 26.09             |
| Hydrophobic (AILFWV) | 34              | 27.20          | 29.57             |
| A Ala                | 6               | 3.31           | 5.22              |
| C Cys                | 4               | 3.21           | 3.48              |
| D Asp                | 11              | 9.84           | 9.57              |
| E Glu                | 9               | 9.03           | 7.83              |
| F Phe                | 3               | 3.43           | 2.61              |
| G Gly                | 4               | 1.77           | 3.48              |
| H His                | 2               | 2.13           | 1.74              |
| I Ile                | 6               | 5.28           | 5.22              |
| K Lys                | 17              | 16.93          | 14.78             |
| L Leu                | 5               | 4.40           | 4.35              |
| M Met                | 1               | 1.02           | 0.87              |
| N Asn                | 2               | 1.77           | 1.74              |
| P Pro                | 4               | 3.02           | 3.48              |
| Q Gln                | 6               | 5.97           | 5.22              |
| R Arg                | 3               | 3.64           | 2.61              |
| S Ser                | 7               | 4.74           | 6.09              |
| T Thr                | 9               | 7.07           | 7.83              |
| V Val                | 14              | 10.78          | 12.17             |
| W Trp                | 0               | 0.00           | 0.00              |
| Y Tyr                | 2               | 2.54           | 1.74              |
| B Asx                | 0               | 0.00           | 0.00              |
| Z Glx                | 0               | 0.00           | 0.00              |
| X Xxx                | 0               | 0.00           | 0.00              |
| Ter                  | 0               | 0.00           | 0.00              |

FIG. 4.11 b

1 GGCACGAGCAAAA ATGAAACTCCTCTTGTGCTTTGCGTTTCGCCGCC  
M K L L L C F A F A A

47 ATCGTCATCGGAGCTCAGGCTCTCACCAGACGAACAGATACAGAAA  
I V I G A Q A L T D E Q I Q K

92 AGGAACAAGATCAGCAAAGAGTGCCAGCAGGTGTCCGGAGTGTCC  
R N K I S K E C Q Q E S G V S

137 CAAGAGACGATCGACAAAGTCCGCACAGGTGTCTTGGTCGACGAT  
Q E T I D K V R T G V L V D D

182 CCCAAAATGAAGAAGCACGTCCTCTGCTTCTCGAAGAAAACCTGGA  
P K M K K H V L C F S K R T G

226 GTGGCAACCGAAGCCGGAGACACCAATGTGGAGGTACTCAAAGCC  
V A T E A G D T N V E V L K A

271 AAGCTGAAGCATGTGGCCAGCGACGAAGAAGTGGACAAGATCGTG  
K L K H V A S D E E V D K I V

316 CAGAAGTGCGTGGTCAAGAAGGCCACACCAGAGGAAACGGCTTAT  
Q K C V V K K A T P E E T A Y

361 GACACCTTCAAGTGTATTTACGACAGTAAACCTGATTTCTCTCCT  
D T F K V I Y D S K P D F S P

406 ATTGATTAATTGTTTTGTATTTGGCTGAATTTTGACAATAAAGGT  
I D \* polyadenylation signal

451 ACTATCGTTATGTAAAAAAAAAAAAAAAAAAAA

poly (A) tail

FIG. 4.12 a

| Analysis                     | Whole Protein |
|------------------------------|---------------|
| Molecular Weight             | 12843.80 m.w. |
| Length                       | 115           |
| 1 microgram =                | 77.859 pMoles |
| Molar Extinction coefficient | 3040±5%       |
| 1 A(280) =                   | 4.22 mg/ml    |
| Isoelectric Point            | 7.11          |
| Charge at pH 7               | 0.13          |

Whole Protein Composition Analysis

| Amino Acid(s)        | Number count | % by weight | % by frequency |
|----------------------|--------------|-------------|----------------|
| Charged (RKHYCDE)    | 48           | 47.19       | 41.74          |
| Acidic (DE)          | 20           | 18.90       | 17.39          |
| Basic (KR)           | 20           | 20.40       | 17.39          |
| Polar (NCQSTY)       | 30           | 25.35       | 26.09          |
| Hydrophobic (AILFWV) | 34           | 27.26       | 29.57          |
| A Ala                | 6            | 3.32        | 5.22           |
| C Cys                | 4            | 3.21        | 3.48           |
| D Asp                | 11           | 9.86        | 9.57           |
| E Glu                | 9            | 9.05        | 7.83           |
| F Phe                | 3            | 3.44        | 2.61           |
| G Gly                | 4            | 1.78        | 3.48           |
| H His                | 2            | 2.14        | 1.74           |
| I Ile                | 6            | 5.29        | 5.22           |
| K Lys                | 18           | 17.97       | 15.65          |
| L Leu                | 5            | 4.41        | 4.35           |
| M Met                | 1            | 1.02        | 0.87           |
| N Asn                | 2            | 1.78        | 1.74           |
| P Pro                | 4            | 3.02        | 3.48           |
| Q Gln                | 6            | 5.98        | 5.22           |
| R Arg                | 2            | 2.43        | 1.74           |
| S Ser                | 7            | 4.75        | 6.09           |
| T Thr                | 9            | 7.08        | 7.83           |
| V Val                | 14           | 10.80       | 12.17          |
| W Trp                | 0            | 0.00        | 0.00           |
| Y Tyr                | 2            | 2.54        | 1.74           |
| B Asx                | 0            | 0.00        | 0.00           |
| Z Glx                | 0            | 0.00        | 0.00           |
| X Xxx                | 0            | 0.00        | 0.00           |
| . Ter                | 0            | 0.00        | 0.00           |

FIG. 4.12 b



↓

|     |      |      |      |    |       |       |        |        |      |       |       |      |
|-----|------|------|------|----|-------|-------|--------|--------|------|-------|-------|------|
| 2-2 | MKLL | LCFA | FAAI | VI | GAQAL | TDEQI | QKRNKI | SKECQQ | VSGV | SQETI | DKVRT | GVLV |
| 2-3 | MKLL | LCFA | FAAI | VI | GAQAL | TDEQI | QKRNKI | SKECQQ | VSGV | SQETI | DKVRT | GVLV |
| 3-4 | MKLL | LCFA | FAAI | VI | GAQAL | TDEQI | QKRNKI | SKECQQ | VSGV | SQETI | DKVRT | GVLV |
| 3-9 | MKLL | LCFA | FAAI | VI | GAQAL | TDEQI | QKRNKI | SKECQQ | VSGV | SQETI | DKVRT | GVLV |
| 7-5 | MKLL | LCFA | FAAI | VI | GAQAL | TDEQI | QKRNKI | SKECQQ | VSGV | SQETI | DKVRT | GVLV |

|     |      |      |      |      |      |       |       |      |      |      |      |    |      |      |
|-----|------|------|------|------|------|-------|-------|------|------|------|------|----|------|------|
| 2-2 | DDPK | MKKH | VLCF | FSKK | TTGV | ATEAG | TDNVE | LKAK | LKHV | ASDE | VEVD | KI | VQKC | VVKK |
| 2-3 | DDPK | MKKH | VLCF | FSKK | TTGV | ATEAG | TDNVE | LKAK | LKHV | ASDE | VEVD | KI | VQKC | VVKK |
| 3-4 | DDPK | MKKH | VLCF | FSKK | TTGV | ATEAG | TDNVE | LKAK | LKHV | ASDE | VEVD | KI | VQKC | VVKK |
| 3-9 | DDPK | MKKH | VLCF | FSKK | TTGV | ATEAG | TDNVE | LKAK | LKHV | ASDE | VEVD | KI | VQKC | VVKK |
| 7-5 | DDPK | MKKH | VLCF | FSKK | TTGV | ATEAG | TDNVE | LKAK | LKHV | ASDE | VEVD | KI | VQKC | VVKK |

|     |      |     |      |      |       |       |     |    |
|-----|------|-----|------|------|-------|-------|-----|----|
| 2-2 | ATPE | EET | AYDT | FFKC | ICYDS | KPPDF | SPI | D* |
| 2-3 | ATPE | EET | AYDT | FFKC | ICYDS | KPPDF | SPI | D* |
| 3-4 | ATPE | EET | AYDT | FFKC | ICYDS | KPPDF | SPI | D* |
| 3-9 | ATPE | EET | AYDT | FFKC | ICYDS | KPPDF | SPI | D* |
| 7-5 | ATPE | EET | AYDT | FFKC | ICYDS | KPPDF | SPI | D* |

FIG. 4.14

| (kDa)       |       | (% mole) |      |      |      |      |      |      |                    |       |      |      |      |      |     |      |      |      |      |      |                    | Thr   | % most hydrophilic |
|-------------|-------|----------|------|------|------|------|------|------|--------------------|-------|------|------|------|------|-----|------|------|------|------|------|--------------------|-------|--------------------|
| MW          | AA    | Cys      | Pro  | Phe  | Ile  | Val  | Met  | Leu  | % most hydrophobic | Gly   | Ala  | Tyr  | His  | Trp  | Asx | Glx  | Arg  | Lys  | Ser  | Thr  | % most hydrophilic |       |                    |
| Tm<br>12.86 | 12.86 | 117      | 3.2  | 3.0  | 3.4  | 4.4  | 8.5  | 2.0  | 4.4                | 28.9  | 3.1  | 3.9  | 3.8  | 3.2  | ND  | 10.7 | 15.0 | 3.6  | 14.9 | 6.8  | 6.3                | 57.3  |                    |
|             | 13.17 | 116      | 3.13 | 2.21 | 4.47 | 5.16 | 10.5 | 1.0  | 4.3                | 29.11 | 1.73 | 3.24 | 0    | 0    | 1.4 | 0    | 0    | 7.12 | 15.6 | 3.31 | 6.14               | 32.14 |                    |
| 2-2         | 12.84 | 115      | 3.21 | 3.02 | 3.44 | 5.29 | 10.8 | 1.02 | 4.41               | 27.26 | 1.78 | 3.32 | 2.54 | 2.14 | 0   | 0    | 0    | 2.43 | 18.0 | 4.75 | 7.08               | 32.23 |                    |
| 2-3         | 12.84 | 115      | 3.21 | 3.02 | 3.44 | 5.29 | 10.8 | 1.02 | 4.41               | 27.26 | 1.78 | 3.32 | 2.54 | 2.14 | 0   | 0    | 0    | 2.43 | 18.0 | 4.75 | 7.08               | 32.23 |                    |
| 3-4         | 12.84 | 115      | 2.41 | 3.02 | 3.44 | 5.29 | 11.6 | 1.02 | 4.41               | 28.04 | 1.78 | 3.32 | 2.54 | 2.14 | 0   | 0    | 0    | 2.43 | 18.0 | 4.75 | 7.09               | 32.24 |                    |
| 3-9         | 12.87 | 115      | 3.21 | 3.02 | 3.43 | 5.28 | 10.8 | 1.02 | 4.40               | 27.20 | 1.77 | 3.31 | 2.54 | 2.13 | 0   | 0    | 0    | 3.64 | 16.9 | 4.74 | 7.07               | 32.38 |                    |
| 7-5         | 12.84 | 115      | 3.21 | 3.02 | 3.44 | 5.29 | 10.8 | 1.02 | 4.41               | 27.26 | 1.78 | 3.32 | 2.54 | 2.14 | 0   | 0    | 0    | 2.43 | 18.0 | 4.75 | 7.08               | 32.23 |                    |

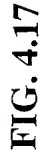
FIG. 4.15

AFP-3

0

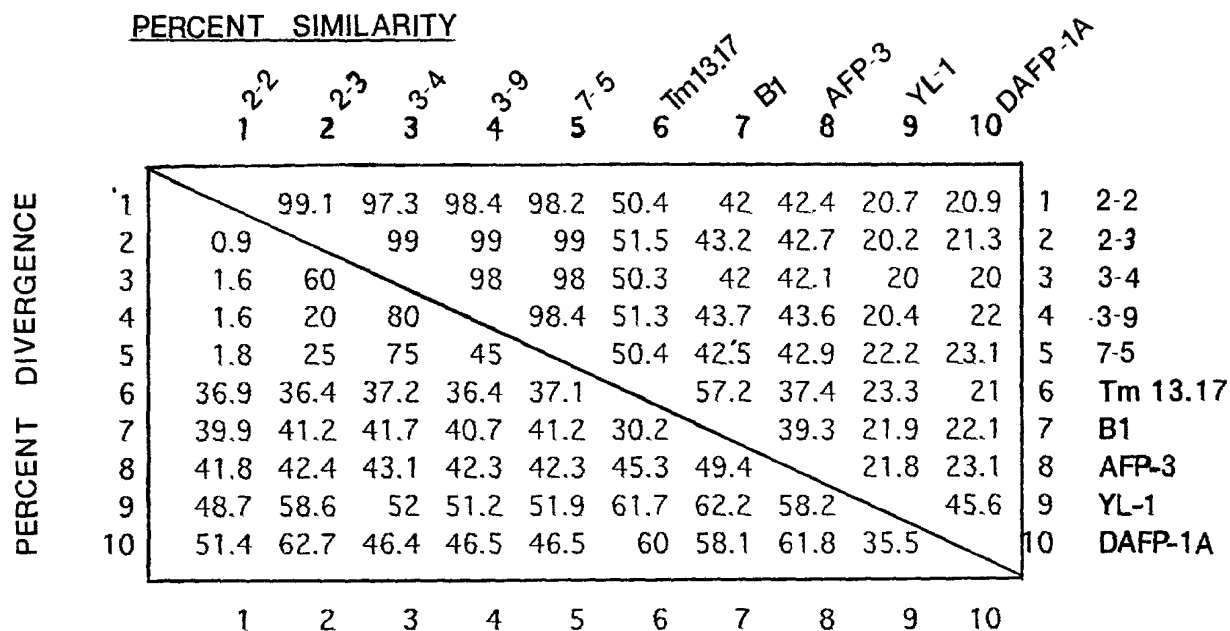
**Aff**

# AFF





# NUCLEOTIDE SEQUENCES



# AMINO ACID SEQUENCES

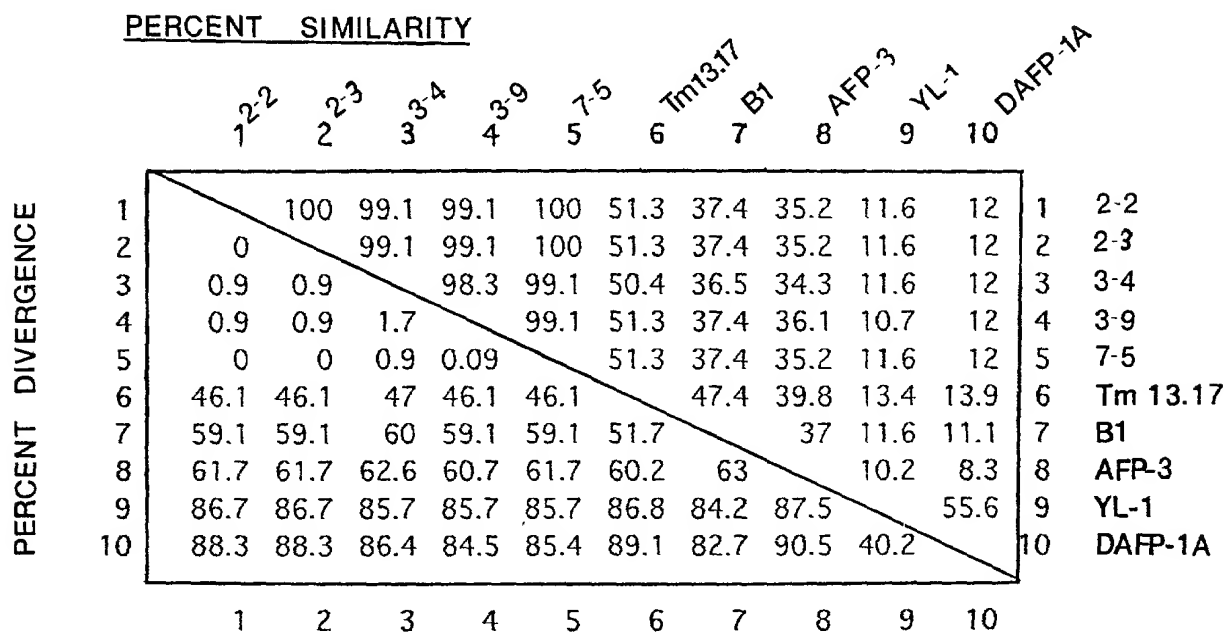


FIG 4.19

T06090-84E92850

09676410-000001

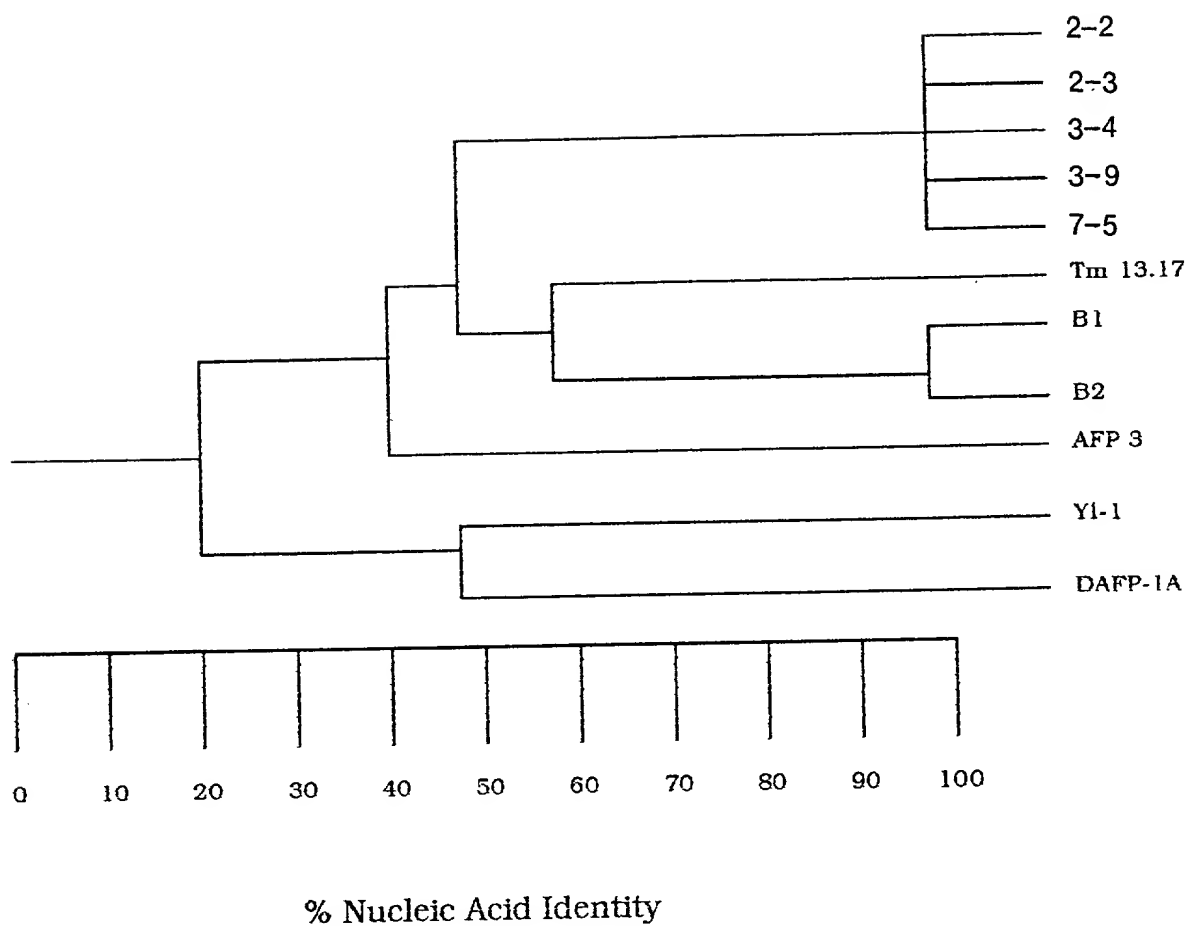
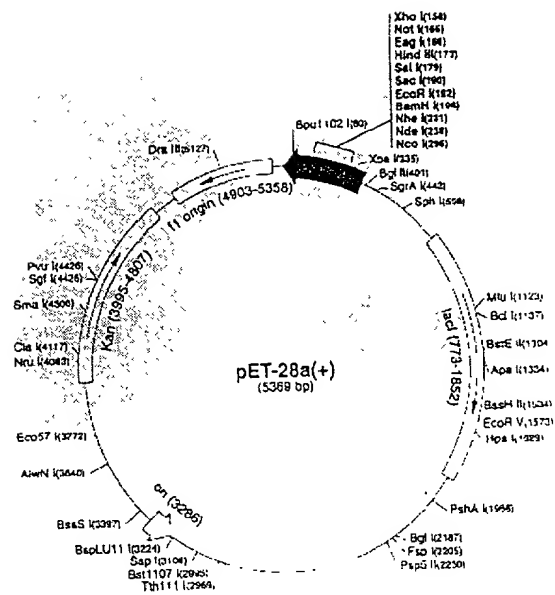
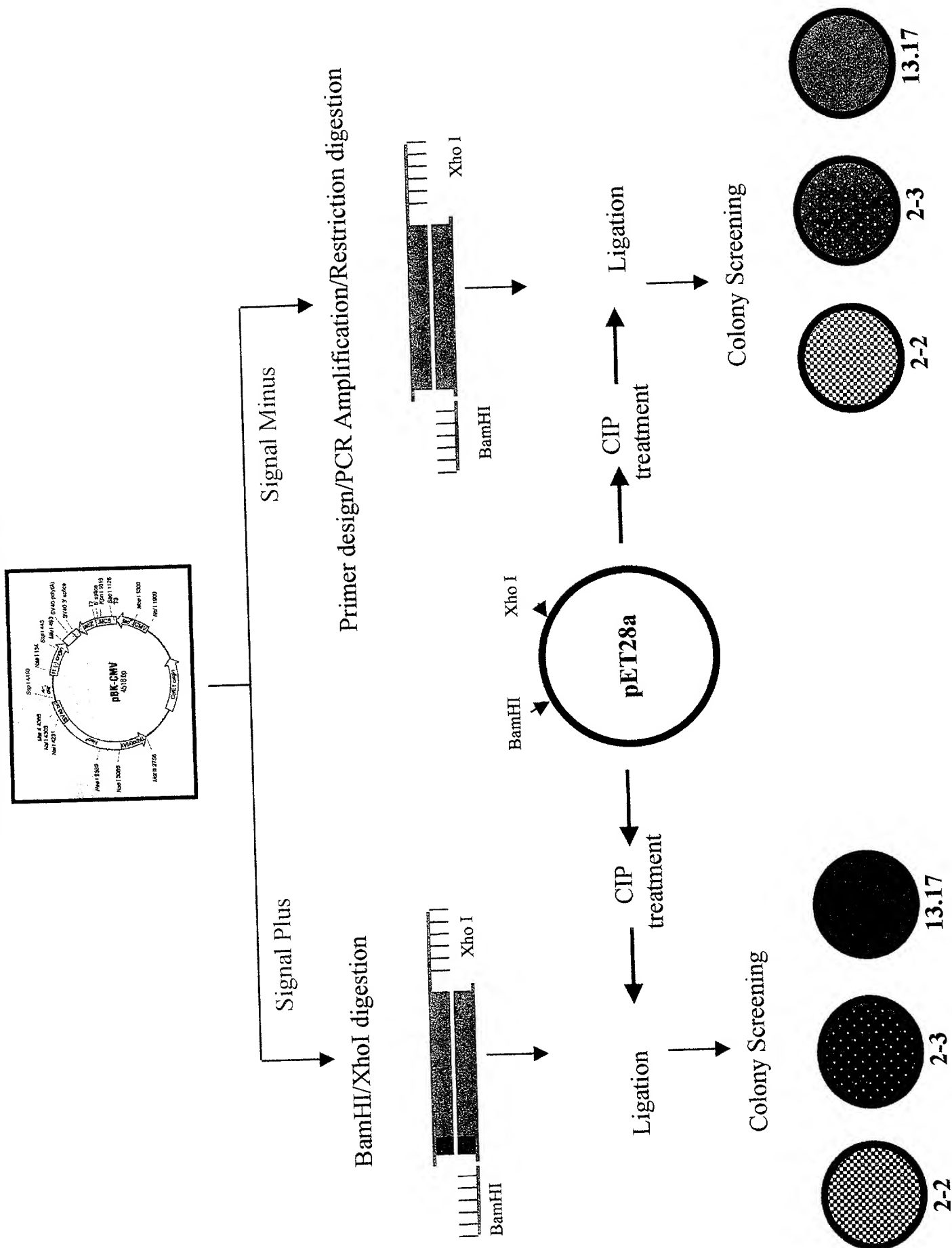


FIG 4.20

[illegible]

**FIG. 5.0**



**FIG. 5.1**

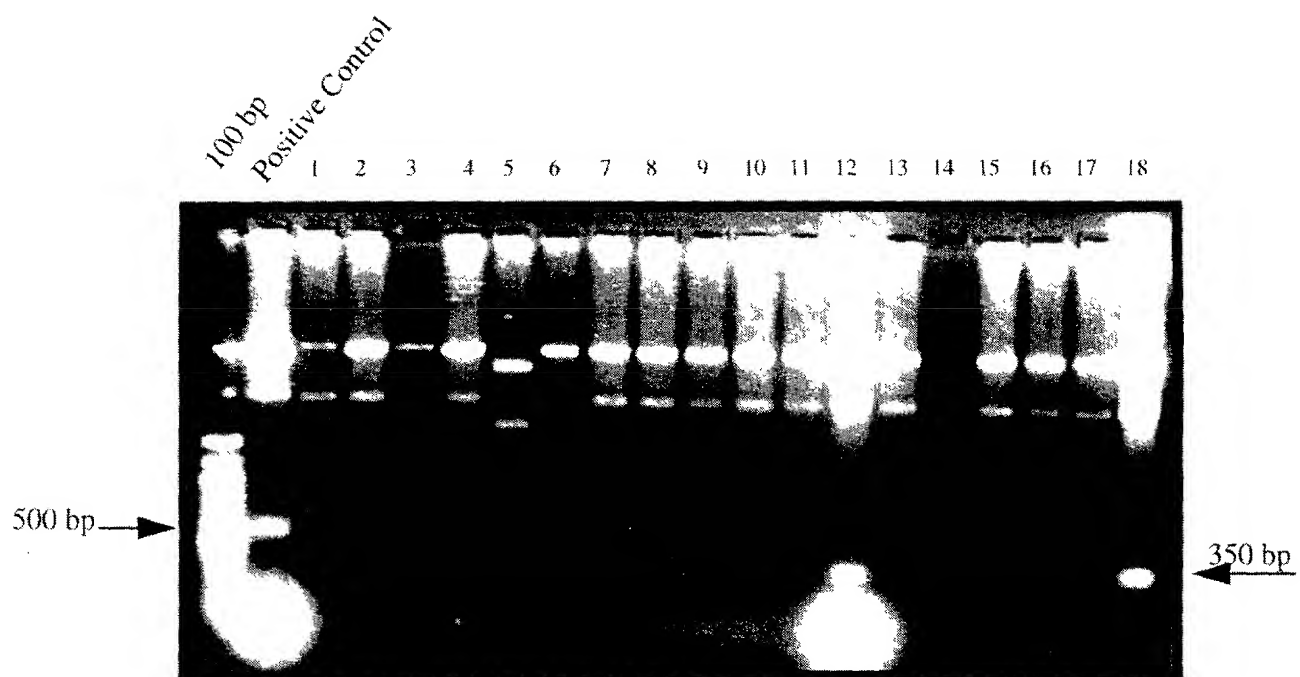


FIG. 5.2

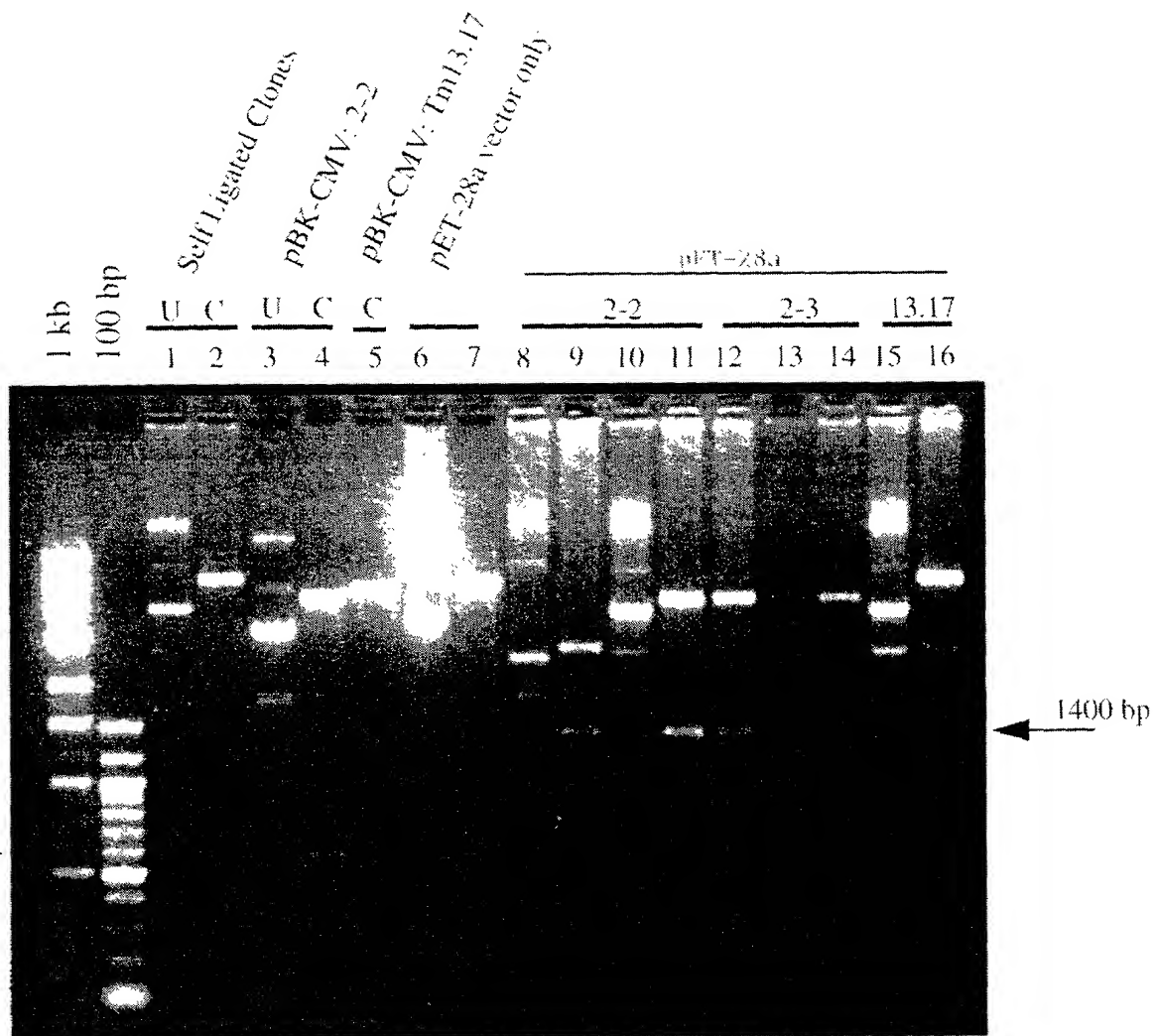


FIG. 5.3

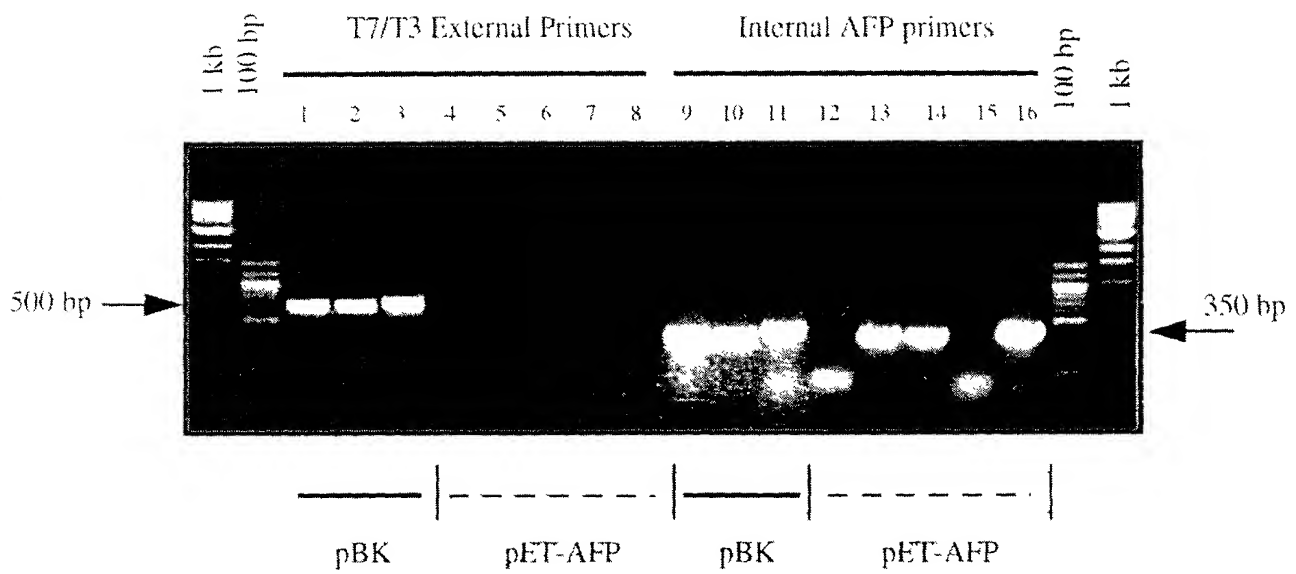


FIG. 5.4

0976348-060704  
"0000" 04092000

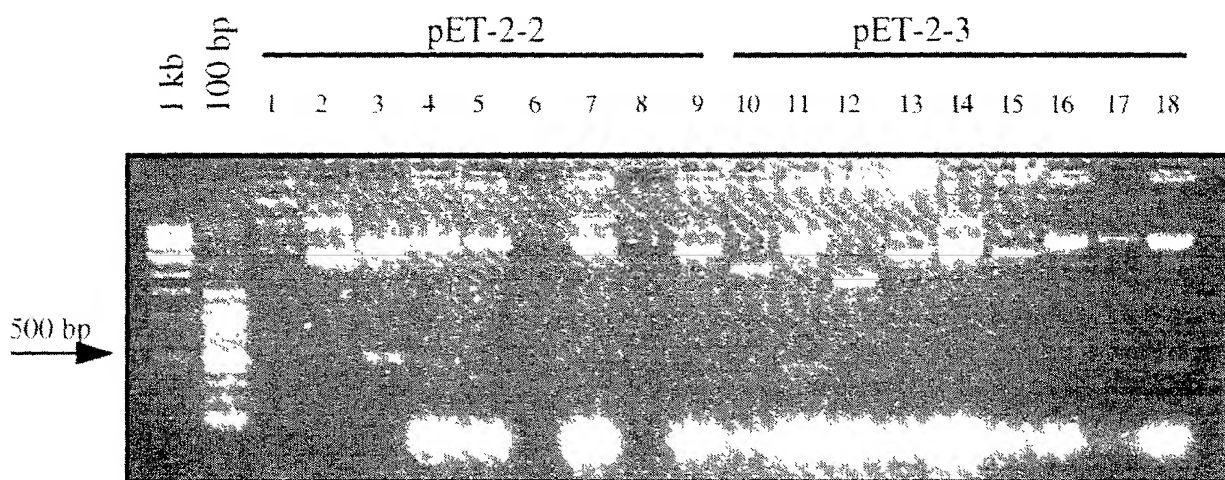
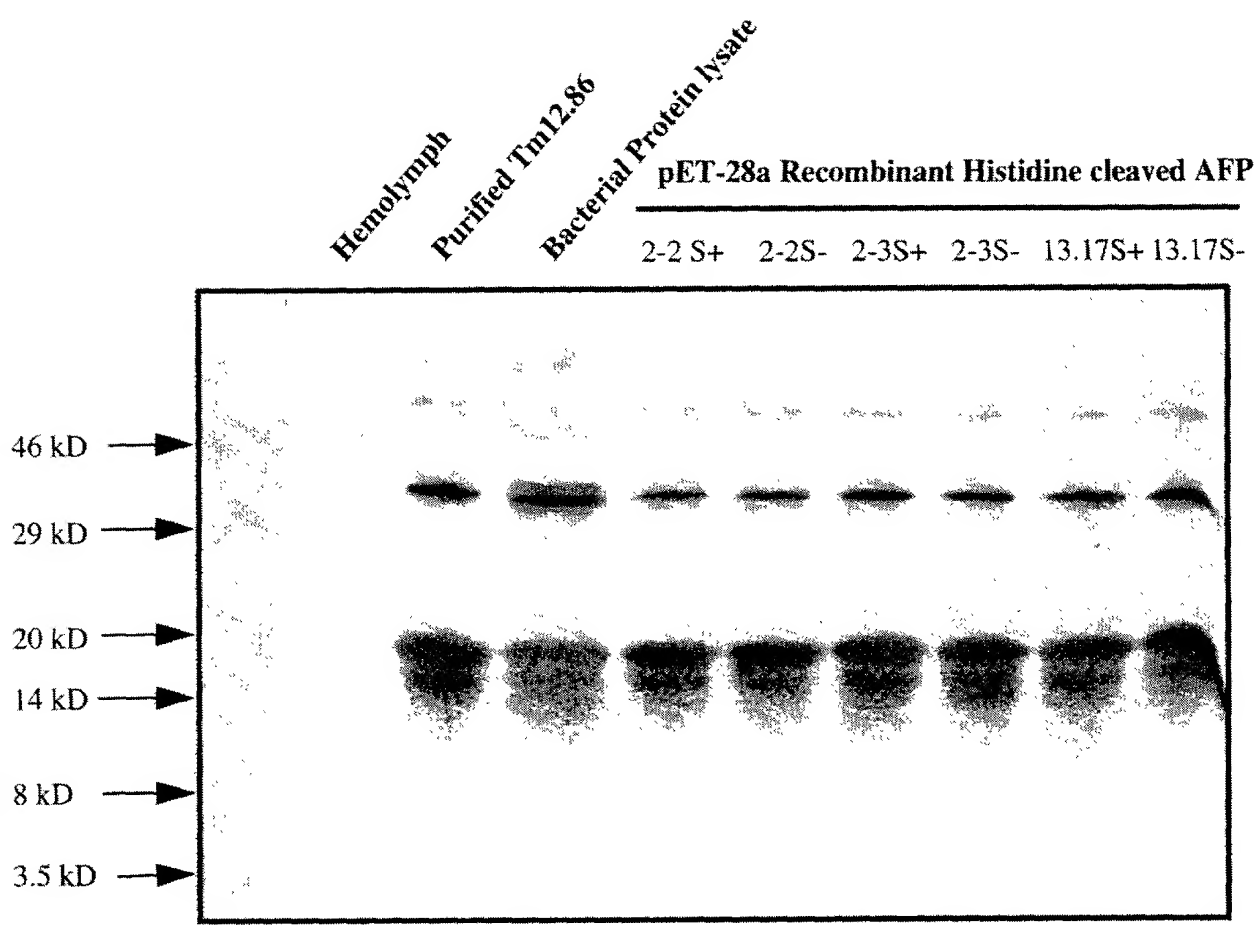


FIG. 5.5

TD-090-849/960



**FIG. 5.6**

His-tagged Clone 2.2 with signal sequence

|  |     |
|--|-----|
| TTGTTAGCGG ATGGAATTCC CTCGTAGGGG ATAATTTTGT TTACTTTAAG             | 50  |
| His-tag Start Codon  |     |
| AAGGAGATAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAT CAC AGC         | 96  |
| Met Gly Ser Ser His His His His His His Ser                        |     |
| -55 -50  |     |
| AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT        | 141 |
| Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly        |     |
| -45 -40 -35  |     |
| AFP Start Codon  |     |
| GGA CAG CAA ATG GGT CGC GGA TCC GAA TTC GCA CGA GCA AAA ATG        | 186 |
| Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys <u>Met</u> |     |
| -30 -25 -20  |     |
| AAA CTC CTC TTG TGC TTT GCG TTC GCC GCC ATC GTC ATC GGA GCT        | 231 |
| <u>Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala</u> |     |
| -15 -10 -5   |     |
| N-terminal of mature AFP   |     |
| CAG GCT CTC ACC GAC GAA CAG ATA CAG AAA AGG AAC AAG ATC AGC        | 276 |
| <u>Gln Ala</u> Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser |     |
| 1 5 10   |     |
| AAA GAA TGC CAG CAG GTG TCC GGA GTG TCC CAA GAG ACG ATC GAC        | 321 |
| Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp        |     |
| 15 20 25   |     |
| AAA GTC CGC ACA GGT GTC TTG GTC GAT GAT CCC AAA ATG AAG AAG        | 366 |
| Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys        |     |
| 30 35 40   |     |
| CAC GTC CTC TGC TTC TCG AAG AAA ACT GGA GTG GCA ACC GAA GCC        | 411 |
| His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala        |     |
| 45 50 55   |     |
| GGA GAC ACC AAT GTG GAG GTA CTC AAA GCC AAG CTG AAG CAT GTG        | 456 |
| Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val        |     |
| 60 65 70   |     |
| GCC AGC GAC GAA GAG GTG GAC AAG ATC GTG CAG AAG TGC GTG GTC        | 501 |
| Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val        |     |
| 75 80 85   |     |
| AAG AAG GCC ACA CCA GAG GAA ACG GCT TAT GAC ACC TTC AAG TGT        | 546 |
| Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys        |     |
| 90 95 100  |     |
| Stop Codon   |     |
| ATT TAC GAC AGT AAA CCT GAT TTC TCT CCT ATT GAT TAA TTGTTTGTGA     | 595 |
| Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp *                  |     |
| 105 110 115  |     |
| Polyadenylation signal Poly-A tail                                 |     |
| TTTGACTGAA TTTTGACAAT AAAGGTAATA TCGTTATGTA AAAAAAAAAA             | 645 |
| AAAAAAAACTCG AGCACCACCA CCACCACCAC TGAGAT                          | 681 |

FIG. 5.7

His-tagged clone 2.2 without signal sequence

|   |     |
|---|-----|
| TTGTTAGCGG ATGGAATTCC CTCGTAGGGG ATAATTTTGT TTACTTTAAG      | 50  |
| His-tag Start Codon   |     |
| AAGGAGATAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAT CAC AGC  | 96  |
| Met Gly Ser Ser His His His His His His Ser                 |     |
| -30 -25   |     |
| AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT | 141 |
| Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly |     |
| -20 -15 -10   |     |
| N-terminal of mature AFP                                    |     |
| GGA CAG CAA ATG GGT CGC GGA TCC CTC ACC GAC GAA CAG ATA CAG | 186 |
| Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln |     |
| -5 1 5  |     |
| AAA AGG AAC AAG ATC AGC AAA GAA TGC CAG CAG GTG TCC GGA GTG | 231 |
| Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val |     |
| 10 15 20  |     |
| TCC CAA GAG ACG ATC GAC AAA GTC CGC ACA GGT GTC TTG GTC GAT | 276 |
| Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp |     |
| 25 30 35  |     |
| GAT CCC AAA ATG AAG AAG CAC GTC CTC TGC TTC TCG AAG AAA ACT | 321 |
| Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr |     |
| 40 45 50  |     |
| GGA GTG GCA ACC GAA GCC GGA GAC ACC AAT GTG GAG GTA CTC AAA | 366 |
| Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys |     |
| 55 60 65  |     |
| GCC AAG CTG AAG CAT GTG GCC AGC GAC GAA GAG GTG GAC AAG ATC | 411 |
| Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile |     |
| 70 75 80  |     |
| GTG CAG AAG TGC GTG GTC AAG AAG GCC ACA CCA GAG GAA ACG GCT | 456 |
| Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala |     |
| 85 90 95  |     |
| TAT GAC ACC TTC AAG TGT ATT TAC GAC AGT AAA CCT GAT TTC TCT | 501 |
| Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser |     |
| 100 105 110   |     |
| Stop Codon  |     |
| CCT ATT GAT TAA CTCGAGCACC ACCACCACCA CCACTGAGAT            | 543 |
| Pro Ile Asp *   |     |
| 115   |     |

FIG. 5.8

His-tagged clone 2.3 with signal sequence

|  |     |
|--|-----|
| TTGTTAGCGG ATGGAATTCC CTCGTAGGGG ATAATTTTGT TTACTTTAAG   | 50  |
| <div>His-tag Start Codon</div> AAGGAGATAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAT CAC AGC <div>Met Gly Ser Ser His His His His His His Ser</div> <div>-55 -50</div>                  | 96  |
| AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly <div>-45 -40 -35</div>                                       | 141 |
| <div>AFP Start Codon</div> GGA CAG CAA ATG GGT CGC GGA TCC GAA TTC GCA CGA GCA AAA ATG Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys <u>Met</u> <div>-30 -25 -20</div>     | 186 |
| AAA CTC CTC TTG TGC TTT GCT TTC GCC GCC ATC GTC ATC GGA GCT Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala <div>-15 -10 -5</div>  | 231 |
| <div>N-terminal of Mature AFP</div> CAG GCT CTC ACC GAC GAA CAG ATA CAG AAA AGG AAC AAG ATC AGC <u>Gln Ala</u> Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser <div>1 5 10</div> | 276 |
| AAA GAA TGC CAG CAG GTG TCC GGA GTG TCC CAA GAG ACG ATC GAC Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp <div>15 20 25</div>  | 321 |
| AAA GTC CGC ACA GGT GTC TTG GTC GAT GAT CCC AAA ATG AAG AAG Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys <div>30 35 40</div>  | 366 |
| CAC GTC CTC TGC TTC TCG AAG AAA ACT GGA GTG GCA ACC GAA GCC His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala <div>45 50 55</div>  | 411 |
| GGA GAC ACC AAT GTG GAG GTA CTC AAA GCC AAG CTG AAG CAT GTG Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val <div>60 65 70</div>  | 456 |
| GCC AGC GAC GAA GAA GTG GAC AAG ATC GTG CAG AAG TGC GTG GTC Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val <div>75 80 85</div>  | 501 |
| AAG AAG GCC ACA CCA GAG GAA ACG GCT TAT GAC ACC TTC AAG TGT Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys <div>90 95 100</div>   | 546 |
| <div>Stop Codon</div> ATT TAC GAC AGT AAA CCT GAT TTC TCT CCT ATT GAT TAA TTGTTTTGTA Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp * <div>105 110 115</div>                        | 595 |
| <div>Polyadenylation signal</div> TTTGACTGAA TTTTGACAAT AAAGGTACTA TCGTTATGAA AAAAAAAAAA <div>Poly-A tail</div>  | 645 |
| AAAAAACTC GAGCACCACC ACCACCACCA CTGAGAT  | 682 |

FIG. 5.9

His-tagged Clone 2.3 without signal sequence

|   |     |
|---|-----|
| TTGTTAGCGG ATGGAATTCC CTCGTAGGGG ATAATTTTGT TTACTTTAAG      | 50  |
| His-tag Start Codon   |     |
| AAGGAGATAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAT CAC AGC  | 96  |
| Met Gly Ser Ser His His His His His His Ser                 |     |
| -30 -25   |     |
| AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT | 141 |
| Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly |     |
| -20 -15 -10   |     |
| N-terminal of mature AFP                                    |     |
| GGA CAG CAA ATG GGT CGC GGA TCC CTC ACC GAC GAA CAG ATA CAG | 186 |
| Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln |     |
| -5 1 5  |     |
| AAA AGG AAC AAG ATC AGC AAA GAA TGC CAG CAG GTG TCC GGA GTG | 231 |
| Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val |     |
| 10 15 20  |     |
| TCC CAA GAG ACG ATC GAC AAA GTC CGC ACA GGT GTC TTG GTC GAT | 276 |
| Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp |     |
| 25 30 35  |     |
| GAT CCC AAA ATG AAG AAG CAC GTC CTC TGC TTC TCG AAG AAA ACT | 321 |
| Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr |     |
| 40 45 50  |     |
| GGA GTG GCA ACC GAA GCC GGA GAC ACC AAT GTG GAG GTA CTC AAA | 366 |
| Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys |     |
| 55 60 65  |     |
| GCC AAG CTG AAG CAT GTG GCC AGC GAC GAA GAA GTG GAC AAG ATC | 411 |
| Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile |     |
| 70 75 80  |     |
| GTG CAG AAG TGC GTG GTC AAG AAG GCC ACA CCA GAG GAA ACG GCT | 456 |
| Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala |     |
| 85 90 95  |     |
| TAT GAC ACC TTC AAG TGT ATT TAC GAC AGT AAA CCT GAT TTC TCT | 501 |
| Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser |     |
| 100 105 110   |     |
| Stop Codon  |     |
| CCT ATT GAT TAA CTCGAGCACC ACCACCACCA CCACTGAGAT            | 543 |
| Pro Ile Asp *   |     |
| 115   |     |

FIG. 5.10

His-tagged Tm 13.17 with signal sequence

|   |     |
|---|-----|
| TTGTTAGCGG ATGGAATTCC CTCGTAGGGG ATAATTTTGT TTA             | 50  |
| His-tag Start Codon   |     |
| AAGGAGATAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAC AGC      | 96  |
| Met Gly Ser Ser His His His His His His Ser                 |     |
| -65 -60 -55   |     |
| AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT | 141 |
| Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly |     |
| -50 -45 -40   |     |
| GGA CAG CAA ATG GGT CGC GGA TCC GAA TTC TGG ATC CAA AGA ATT | 186 |
| Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Trp Ile Gln Arg Ile |     |
| -35 -30 -25   |     |
| AFP Start Codon   |     |
| CGG CAC GAG ACT ACT AAG ATG AAG TTG CTC TGT TGT CTA ATC TCC | 231 |
| Arg His Glu Thr Thr Lys Met Lys Leu Leu Cys Cys Leu Ile Ser |     |
| -20 -15 -10   |     |
| N-terminal of mature AFP                                    |     |
| CTC ATT CTG TTG GTC ACA GTT CAG GCC CTG ACC GAG GCA CAA ATT | 276 |
| Leu Ile Leu Leu Val Thr Val Gln Ala Leu Thr Glu Ala Gln Ile |     |
| -5 1 5  |     |
| GAG AAA CTG AAC AAG ATC AGC AAA AAA TGT CAA AAT GAA AGT GGA | 321 |
| Glu Lys Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly |     |
| 10 15 20  |     |
| GTG TCG CAA GAG ATC ATA ACC AAA GCT CGC AAC GGT GAC TGG GAG | 366 |
| Val Ser Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu |     |
| 25 30 35  |     |
| GAC GAT CCT AAA CTG AAA CGC CAA GTT TTT TGC GTG GCC AGG AAC | 411 |
| Asp Asp Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn |     |
| 40 45 50  |     |
| GCC GGT CTG GCC ACG GAA TCG GGA GAG GTG GTG GTC GAC GTG TTG | 456 |
| Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu |     |
| 55 60 65  |     |
| AGG GAG AAG GTG AGG AAG GTC ACT GAC AAC GAC GAA GAA ACT GAG | 501 |
| Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu |     |
| 70 75 80  |     |
| AAA ATC ATC AAT AAG TGC GCC GTC AAG AGA GAT ACT GTT GAA GAG | 546 |
| Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu |     |
| 85 90 95  |     |
| ACG GTG TTC AAT ACT TTC AAA TGT GTC ATG AAA AAC AAG CCA AAG | 595 |
| Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys |     |
| 100 105 110   |     |
| Stop Codon  |     |
| TTC TCA CCA GTT GAT TGA ACCACCACGA CTAGTAGATG GTTCAAATGG    | 643 |
| Phe Ser Pro Val Asp *                                       |     |
| 115   |     |
| Polyadenylation signal Poly-A tail                          |     |
| TGTGCTTTAC ATATAAAAT AAAGTGTTC TGATGTAAAA AAAAAAAAAA        | 693 |
| AAAAAAAAAA AACTCGAGAG TATTCTAGAG CGGCCGCGGG CCCATCGTTT      | 743 |
| TCCACCCCTC GAGCACCACC ACCACCACCA CTGAGAT                    | 777 |

FIG. 5.11

His-tagged Tm 13.17 without signal sequence

|   |     |
|---|-----|
| TTGTTAGCGG ATGGAATTCC CTCGTAGGGG ATAATTTTGT TTACTTTAAG      | 50  |
| His-tag Start Codon   |     |
| AAGGAGATAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAT CAC AGC  | 96  |
| Met Gly Ser Ser His His His His His His Ser                 |     |
| -30 -25   |     |
| AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT | 141 |
| Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly |     |
| -20 -15 -10   |     |
| N-terminal of mature AFP                                    |     |
| GGA CAG CAA ATG GGT CGC GGC CTG ACC GAG GCA CAA ATT GAG AAA | 186 |
| Gly Gln Gln Met Gly Arg Gly Leu Thr Glu Ala Gln Ile Glu Lys |     |
| -5 1 5  |     |
| CTG AAC AAG ATC AGC AAA AAA TGT CAA AAT GAA AGT GGA GTG TCG | 231 |
| Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly Val Ser |     |
| 10 15 20  |     |
| CAA GAG ATC ATA ACC AAA GCT CGC AAC GGT GAC TGG GAG GAC GAT | 276 |
| Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu Asp Asp |     |
| 25 30 35  |     |
| CCT AAA CTG AAA CGC CAA GTT TTT TGC GTG GCC AGG AAC GCC GGT | 321 |
| Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn Ala Gly |     |
| 40 45 50  |     |
| CTG GCC ACG GAA TCG GGA GAG GTG GTG GTC GAC GTG TTG AGG GAG | 366 |
| Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu Arg Glu |     |
| 55 60 65  |     |
| AAG GTG AGG AAG GTC ACT GAC AAC GAC GAA GAA ACT GAG AAA ATC | 411 |
| Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu Lys Ile |     |
| 70 75 80  |     |
| ATC AAT AAG TGC GCC GTC AAG AGA GAT ACT GTT GAA GAG ACG GTG | 456 |
| Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu Thr Val |     |
| 85 90 95  |     |
| TTC AAT ACT TTC AAA TGT GTC ATG AAA AAC AAG CCA AAG TTC TCA | 501 |
| Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys Phe Ser |     |
| 100 105 110   |     |
| Stop Codon  |     |
| CCA GTT GAT TGA CTCGAGCACC ACCACCACCA CCACTGAGAT            | 543 |
| Pro Val Asp *   |     |
| 115   |     |

FIG. 5.12

MW(KD)      1      2

94.0 →

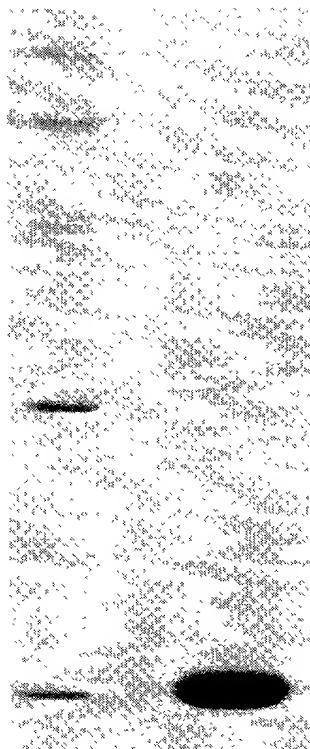
67.0 →

43.0 →

30.0 →

20.1 →

14.4 →



**FIG. 6.0**

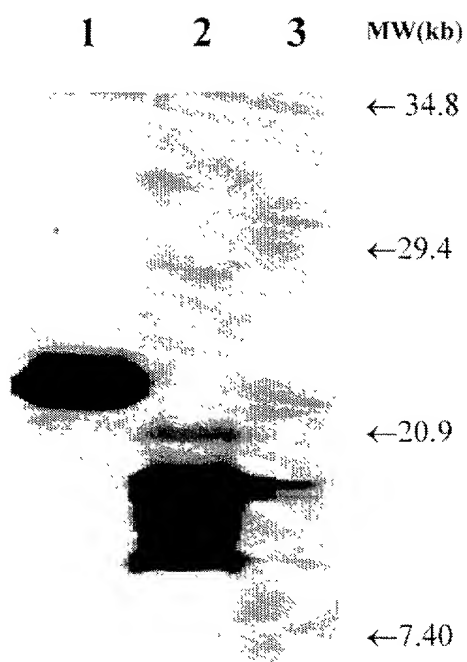


FIG. 6.1

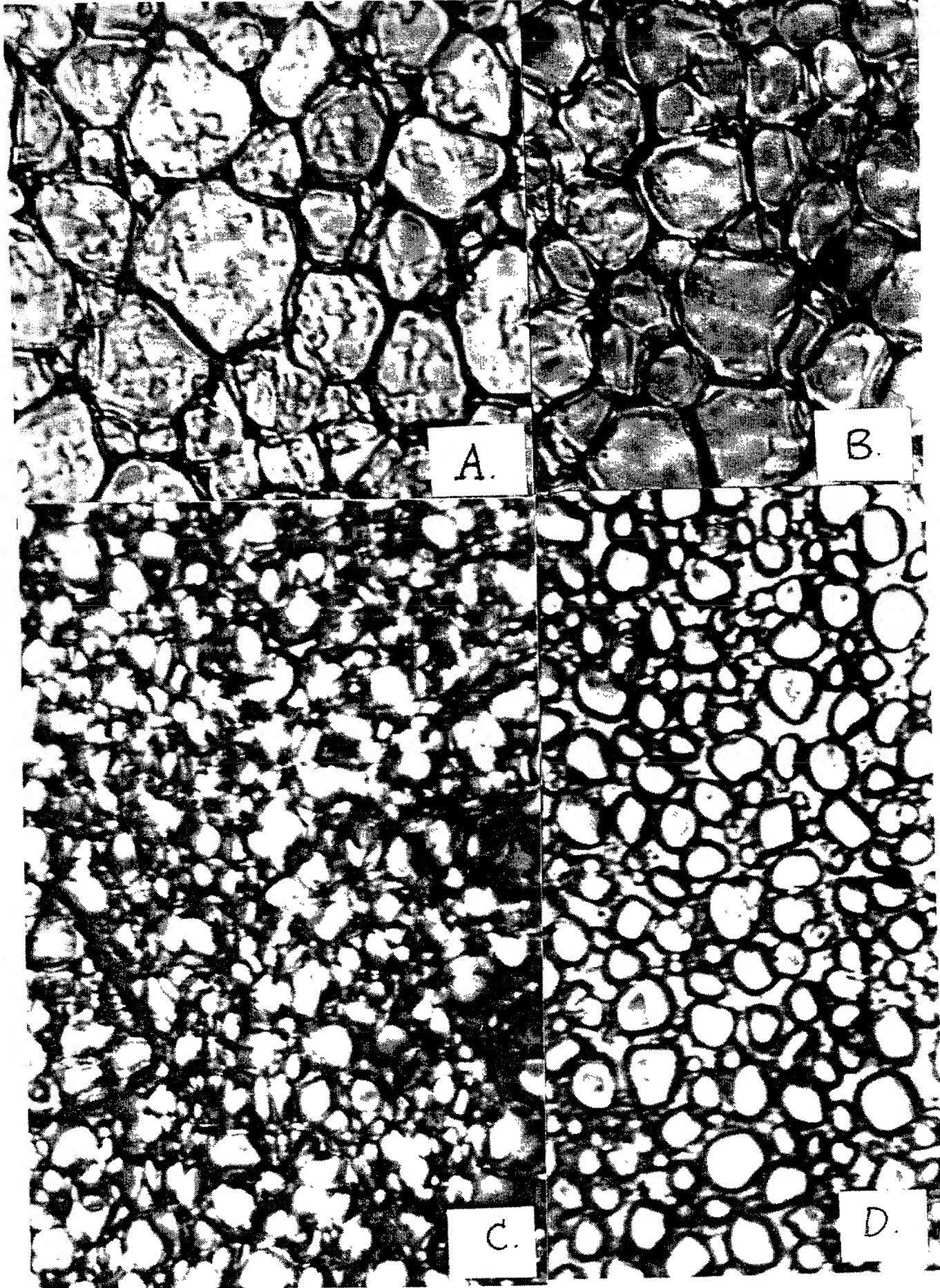


FIG. 6.2

T02000" 24E92860

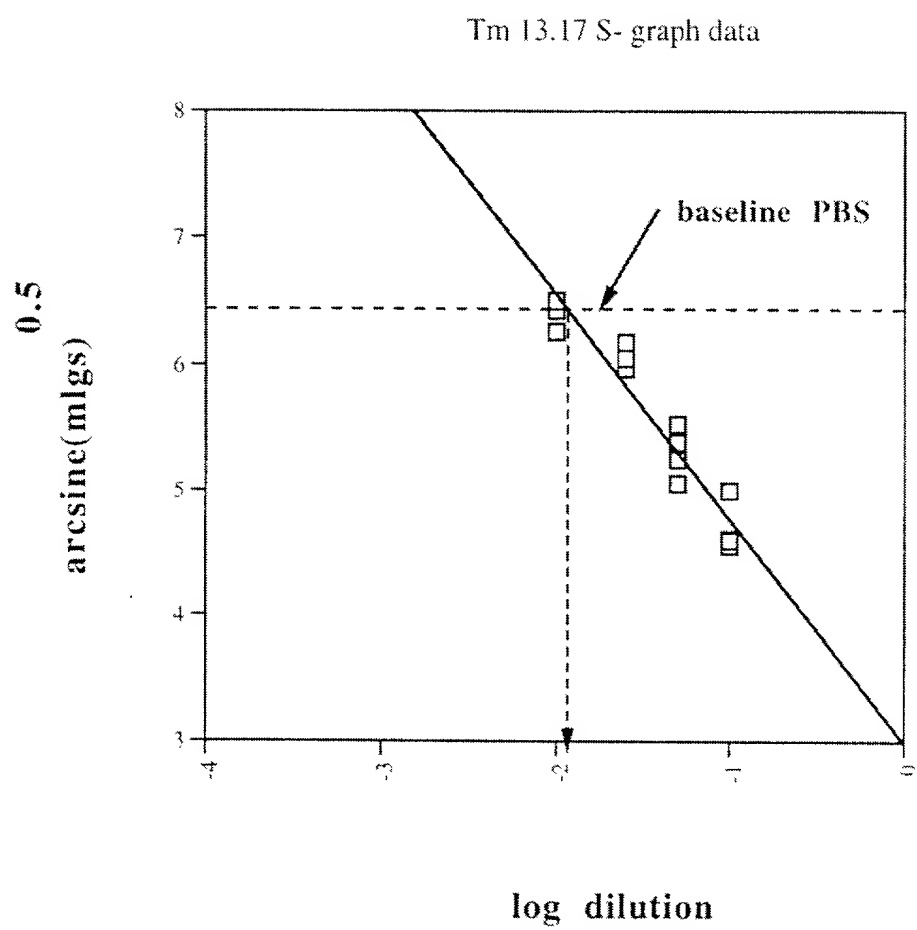


FIG. 6.3

| ONE LETTER | NAME          | THREE LETTER | CHEMICAL CLASS           | HYDROPHOBICITY     | Reactivity |
|------------|---------------|--------------|--------------------------|--------------------|------------|
| A          | Alanine       | Ala          | aliphatic                | mod. hydrophobic   | low        |
| B          | Asp or Asn    | Asx          |                          |                    |            |
| C          | Cysteine      | Cys          | sulfhydryl               | hydrophobic        | high       |
| D          | Aspartic Acid | Asp          | acidic                   | highly hydrophilic | high       |
| E          | Glutamic Acid | Glu          | acidic                   | highly hydrophilic | high       |
| F          | Phenylalanine | Phe          | aromatic                 | highly hydrophobic | low        |
| G          | Glycine       | Gly          | aliphatic                | mod. hydrophobic   | low        |
| H          | Histidine     | His          | basic, imidazole         | highly hydrophilic | high       |
| I          | Isoleucine    | Ile          | aliphatic                | hydrophobic        | low        |
| J          |               |              |                          |                    |            |
| K          | Lysine        | Lys          | basic                    | highly hydrophilic | high       |
| L          | Leucine       | Leu          | aliphatic                | hydrophobic        | low        |
| M          | Methionine    | Met          | sulfhydryl               | hydrophobic        | low        |
| N          | Asparagine    | Asn          | amide, acidic derived    | hydrophilic        | high       |
| O          |               |              |                          |                    |            |
| P          | Proline       | Pro          | aliphatic, cyclic, imino | mod. hydrophilic   | low        |
| Q          | Glutamine     | Gln          | amide, acidic derived    | hydrophilic        | high       |
| R          | Arginine      | Arg          | basic                    | highly hydrophilic | high       |
| S          | Serine        | Ser          | aliphatic hydroxyl       | hydrophilic        | high       |
| T          | Threonine     | Thr          | aliphatic hydroxyl       | hydrophilic        | high       |
| U          |               |              |                          |                    |            |
| V          | Valine        | Val          | aliphatic                | hydrophobic        | low        |
| W          | Tryptophan    | Trp          | aromatic                 | highly hydrophobic | low        |
| X          |               |              |                          |                    |            |
| Y          | Tyrosine      | Tyr          | aromatic                 | mod. hydrophilic   | high       |
| Z          | Glu or Gln    | Glx          |                          |                    |            |
|            |               | ACD          | Any Acidic               |                    |            |
|            |               | ALP          | Any Aliphatic            |                    |            |
|            |               | ALH          | Any Aliphatic Hydroxyl   |                    |            |
|            |               | ARO          | Any Aromatic             |                    |            |
|            |               | BAS          | Any Basic                |                    |            |
|            |               | HY-          | Hydrophobic              |                    |            |
|            |               | HY+          | Hydrophilic              |                    |            |

FIG. 7.1

| Position | Tm 12.84-2.2 | Tm 12.84-2.3 | Tm 12.84-3.4 | Tm 12.84-3.9 | Tm 12.84-7.5 | Consensus of<br>Tm 12.84 | Tm 13.17 | Consensus with<br>Tm 13.17 | B1  | Consensus with<br>B1 | AFP-3 | Consensus with<br>AFP-3 |
|----------|--------------|--------------|--------------|--------------|--------------|--------------------------|----------|----------------------------|-----|----------------------|-------|-------------------------|
| 1        | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | N                       |
| 2        | C            | G            | G            | G            | G            | C                        | G        | N                          |     | N                    | A     | N                       |
| 3        | G            | A            | A            | A            | A            | G                        | A        | R                          |     | R                    | G     | R                       |
| 4        | A            | G            | G            | G            | G            | A                        | C        | N                          |     | N                    | A     | N                       |
| 5        | C            | C            | C            | C            | C            | C                        | T        | N                          |     | N                    | T     | N                       |
| 6        | A            | A            | A            | A            | A            | A                        | A        | N                          |     | N                    | C     | N                       |
| 7        | A            | A            | A            | A            | A            | A                        | A        | A                          |     | N                    | G     | N                       |
| 8        | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | A     | A                       |
| 9        | A            | A            | A            | A            | A            | A                        | A        | R                          |     | R                    | G     | R                       |
| 10       | A            | A            | A            | A            | A            | A                        | A        | .                          |     | .                    | A     | A                       |
| 11       | A            | A            | A            | A            | A            | A                        | A        | .                          |     | .                    | G     | R                       |
| 12       |              |              |              |              |              |                          |          |                            |     |                      | .     | .                       |
| 13       | A            | A            | A            | A            | A            | A                        | A        | A                          | A?  | A                    | A     | A                       |
| 14       | T            | T            | T            | T            | T            | T                        | T        | G                          | T?  | T                    | T     | T                       |
| 15       | G            | G            | G            | G            | G            | G                        | G        | A                          | G?  | G                    | G     | G                       |
| 16       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | A     | A                       |
| 17       | A            | A            | A            | A            | A            | A                        | A        | R                          |     | R                    | A     | A                       |
| 18       | A            | A            | A            | A            | A            | A                        | A        | Y                          |     | Y                    | C     | C                       |
| 19       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | C     | C                       |
| 20       | T            | T            | T            | T            | T            | T                        | T        | G                          |     | G                    | T     | T                       |
| 21       | C            | C            | C            | C            | C            | C                        | C        | C                          | C/G | C/G                  | C     | C                       |
| 22       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | C     | C                       |
| 23       | T            | T            | T            | T            | T            | T                        | T        | C                          |     | C                    | T     | T                       |
| 24       | T            | T            | T            | T            | T            | T                        | T        | T                          |     | T                    | C     | C                       |
| 25       | T            | T            | T            | T            | T            | T                        | T        | N                          |     | N                    | T     | T                       |
| 26       | T            | T            | T            | T            | T            | T                        | T        | N                          |     | N                    | T     | T                       |
| 27       | G            | G            | G            | G            | G            | G                        | G        | T                          |     | T                    | G     | G                       |
| 28       | T            | T            | T            | T            | T            | T                        | T        | G                          |     | G                    | T     | T                       |
| 29       | G            | G            | G            | G            | G            | G                        | G        | Y                          |     | Y                    | T     | T                       |
| 30       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | C     | C                       |
| 31       | T            | T            | T            | T            | T            | T                        | T        | A                          |     | A                    | T     | T                       |
| 32       | T            | T            | T            | T            | T            | T                        | T        | A                          |     | A                    | T     | T                       |
| 33       | T            | T            | T            | T            | T            | T                        | T        | T                          |     | T                    | T     | T                       |
| 34       | G            | G            | G            | G            | G            | G                        | G        | R                          | T/A | R                    | T     | T                       |
| 35       | C            | C            | C            | C            | C            | C                        | C        | N                          |     | N                    | G     | G                       |
| 36       | T            | T            | T            | T            | T            | T                        | T        | T                          |     | T                    | C     | C                       |
| 37       | T            | T            | T            | T            | T            | T                        | T        | C                          |     | C                    | T     | T                       |
| 38       | C            | C            | C            | C            | C            | C                        | C        | Y                          |     | Y                    | C     | C                       |
| 39       | G            | G            | G            | G            | G            | G                        | G        | C                          |     | C                    | T     | T                       |
| 40       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | C     | C                       |
| 41       | C            | C            | C            | C            | C            | C                        | C        | C                          |     | C                    | T     | T                       |
| 42       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | T     | T                       |
| 43       | C            | C            | C            | C            | C            | C                        | C        | A                          |     | A                    | T     | T                       |
| 44       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | G     | G                       |
| 45       | C            | C            | C            | C            | C            | C                        | C        | R                          |     | R                    | C     | C                       |
| 46       | A            | A            | A            | A            | A            | A                        | A        | Y                          |     | Y                    | T     | T                       |
| 47       | T            | T            | T            | T            | T            | T                        | T        | N                          |     | N                    | C     | C                       |
| 48       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | T     | T                       |
| 49       | G            | G            | G            | G            | G            | G                        | G        | C                          | C/G | C/G                  | G     | G                       |
| 50       | T            | T            | T            | T            | T            | T                        | T        | N                          |     | N                    | T     | T                       |
| 51       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | C     | C                       |
| 52       | A            | A            | A            | A            | A            | A                        | A        | R                          |     | R                    | C     | C                       |
| 53       | T            | T            | T            | T            | T            | T                        | T        | C                          |     | C                    | G     | G                       |
| 54       | C            | C            | C            | C            | C            | C                        | C        | R                          |     | R                    | C     | C                       |
| 55       | G            | G            | G            | G            | G            | G                        | G        | C                          |     | C                    | G     | G                       |
| 56       | A            | A            | A            | A            | A            | A                        | A        | G                          | G/C | G/C                  | G     | G                       |
| 57       | G            | G            | G            | G            | G            | G                        | G        | T                          |     | T                    | A     | A                       |
| 58       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | C     | C                       |
| 59       | T            | T            | T            | T            | T            | T                        | T        | C                          |     | C                    | T     | T                       |
| 60       | C            | C            | C            | C            | C            | C                        | C        | A                          |     | A                    | C     | C                       |
| 61       | A            | A            | A            | A            | A            | A                        | A        | G                          |     | G                    | C     | C                       |
| 62       | A            | A            | A            | A            | A            | A                        | A        | G                          |     | G                    | C     | C                       |
| 63       | G            | G            | G            | G            | G            | G                        | G        | C                          |     | C                    | C     | C                       |
| 64       | C            | C            | C            | C            | C            | C                        | C        | C                          |     | C                    | C     | C                       |
| 65       | T            | T            | T            | T            | T            | T                        | T        | Y                          |     | Y                    | C     | C                       |
| 66       | T            | T            | T            | T            | T            | T                        | T        | C                          |     | C                    | T     | T                       |
| 67       | C            | C            | C            | C            | C            | C                        | C        | T                          |     | T                    | C     | C                       |
| 68       | T            | T            | T            | T            | T            | T                        | T        | T                          |     | T                    | C     | C                       |
| 69       | C            | C            | C            | C            | C            | C                        | C        | C                          |     | C                    | C     | C                       |
| 70       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 71       | C            | C            | C            | C            | C            | C                        | C        | C                          |     | C                    | C     | C                       |
| 72       | C            | C            | C            | C            | C            | C                        | C        | G                          |     | G                    | C     | C                       |
| 73       | A            | A            | A            | A            | A            | A                        | A        | G                          |     | G                    | C     | C                       |
| 74       | C            | C            | C            | C            | C            | C                        | C        | A                          |     | A                    | C     | C                       |
| 75       | G            | G            | G            | G            | G            | G                        | G        | N                          |     | N                    | C     | C                       |
| 76       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 77       | A            | A            | A            | A            | A            | A                        | A        | C                          |     | C                    | C     | C                       |
| 78       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 79       | C            | C            | C            | C            | C            | C                        | C        | A                          |     | A                    | C     | C                       |
| 80       | A            | A            | A            | A            | A            | A                        | A        | R                          |     | R                    | C     | C                       |
| 81       | G            | G            | G            | G            | G            | G                        | G        | A                          |     | A                    | C     | C                       |
| 82       | A            | A            | A            | A            | A            | A                        | A        | T                          |     | T                    | C     | C                       |
| 83       | T            | T            | T            | T            | T            | T                        | T        | T                          |     | T                    | T     | T                       |
| 84       | A            | A            | A            | A            | A            | A                        | A        | C                          |     | C                    | G     | G                       |
| 85       | C            | C            | C            | C            | C            | C                        | C        | G                          |     | G                    | A     | A                       |
| 86       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | A     | A                       |
| 87       | G            | G            | G            | G            | G            | G                        | G        | A                          |     | A                    | A     | A                       |
| 88       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | A     | A                       |
| 89       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | A     | A                       |
| 90       | A            | A            | A            | A            | A            | A                        | A        | N                          |     | N                    | C     | C                       |
| 91       | A            | A            | A            | A            | A            | A                        | A        | N                          |     | N                    | T     | T                       |
| 92       | G            | G            | G            | G            | G            | G                        | G        | G                          |     | G                    | T     | T                       |
| 93       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | A     | A                       |
| 94       | A            | A            | A            | A            | A            | A                        | A        | C                          |     | C                    | G     | G                       |
| 95       | C            | C            | C            | C            | C            | C                        | C        | C                          |     | C                    | A     | A                       |
| 96       | A            | A            | A            | A            | A            | A                        | A        | C                          |     | C                    | A     | A                       |
| 97       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 98       | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 99       | A            | A            | A            | A            | A            | A                        | A        | G                          |     | G                    | C     | C                       |
| 100      | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 101      | T            | T            | T            | T            | T            | T                        | T        | C                          |     | C                    | A     | A                       |
| 102      | C            | C            | C            | C            | C            | C                        | C        | A                          |     | A                    | C     | C                       |
| 103      | A            | A            | A            | A            | A            | A                        | A        | G                          |     | G                    | C     | C                       |
| 104      | G            | G            | G            | G            | G            | G                        | G        | C                          |     | C                    | C     | C                       |
| 105      | C            | C            | C            | C            | C            | C                        | C        | A                          |     | A                    | C     | C                       |
| 106      | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 107      | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 108      | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 109      | G            | G            | G            | G            | G            | G                        | G        | R                          |     | R                    | C     | C                       |
| 110      | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | C     | C                       |
| 111      | T            | T            | T            | T            | T            | T                        | T        | T                          |     | T                    | C     | C                       |
| 112      | G            | G            | G            | G            | G            | G                        | G        | Y                          |     | Y                    | C     | C                       |
| 113      | C            | C            | C            | C            | C            | C                        | C        | C                          |     | C                    | A     | A                       |
| 114      | C            | C            | C            | C            | C            | C                        | C        | A                          |     | A                    | G     | G                       |
| 115      | C            | C            | C            | C            | C            | C                        | C        | R                          |     | R                    | A     | A                       |
| 116      | A            | A            | A            | A            | A            | A                        | A        | A                          |     | A                    | A     | A                       |
| 117      | G            | G            | G            | G            | G            | G                        | G        | R                          |     | R                    | A     | A                       |

FIG. 7.2

| Position | Tm 12.84-2.2 | Tm 12.84-2.3 | Tm 12.84-3.4 | Tm 12.84-3.9 | Tm 12.84-7.5 | Consensus of | Tm13.17 | Consensus with | B1  | Consensus with | APP-3 | Consensus with |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|---------|----------------|-----|----------------|-------|----------------|
| 119      | C            | C            | C            | C            | C            | C            | A       | N              | C   | N              | G     | N              |
| 120      | A            | A            | A            | A            | A            | A            | T       | A              | T   | N              | C     | N              |
| 121      | G            | G            | G            | G            | G            | G            | G       | G              | G   | G              | G     | G              |
| 122      | T            | T            | T            | T            | T            | T/A          | A       | T/A            | A   | T/A            | A/T   | A/T            |
| 123      | G            | T            | G            | A            | G            | G            | A       | R              | A   | R              | R     | R              |
| 124      | T            | T            | T            | T            | T            | G            | A       | T/A            | A   | T/A            | T/A   | T/A            |
| 125      | C            | C            | C            | C            | C            | C            | G       | C/G            | G   | C/G            | C     | C/G            |
| 126      | C            | C            | C            | C            | C            | C            | T       | Y              | T   | Y              | T     | Y              |
| 127      | G            | G            | G            | G            | G            | G            | G       | G              | G   | G              | G     | G              |
| 128      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 129      | G            | A            | G            | G            | G            | G            | G       | G              | G   | G              | G     | G              |
| 130      | T            | T            | T            | T            | T            | T            | T       | T              | T   | T              | T     | T              |
| 131      | G            | T            | T            | T            | T            | T            | G       | G              | G   | G              | A     | R              |
| 132      | T            | T            | T            | T            | T            | T            | T       | T              | T   | T              | T     | T              |
| 133      | C            | C            | C            | C            | C            | C            | C       | C              | C   | C              | C     | C              |
| 134      | C            | C            | C            | C            | C            | C            | C       | C              | C   | C              | C     | C              |
| 135      | C            | C            | C            | C            | C            | C            | G       | C/G            | C   | C/G            | T     | N              |
| 136      | A            | A            | A            | A            | A            | A            | A       | C              | A   | A              | G     | C/G            |
| 137      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 138      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 139      | G            | A            | A            | A            | A            | A            | G       | A              | G   | A              | A     | A              |
| 140      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 141      | G            | A            | A            | A            | A            | A            | G       | A              | G   | A              | A     | A              |
| 142      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 143      | C            | C            | C            | C            | C            | C            | G       | G              | C   | G/C            | G     | G/C            |
| 144      | A            | G            | A            | A            | A            | A            | C       | Y              | T   | R              | T     | N              |
| 145      | T            | A            | C            | A            | A            | A            | T       | G/C            | C   | G/C            | C     | G/C            |
| 146      | C            | C            | C            | C            | C            | C            | A       | A              | A   | A              | T     | N              |
| 147      | G            | G            | G            | G            | G            | G            | C       | N              | A   | R              | C     | R              |
| 148      | A            | A            | A            | A            | A            | A            | C       | R              | A   | N              | A     | N              |
| 149      | C            | C            | C            | C            | C            | C            | C       | C              | G   | C/G            | C     | C/G            |
| 150      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 151      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 152      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 153      | G            | A            | A            | A            | A            | A            | G       | Y              | G   | R              | R     | R              |
| 154      | T            | T            | C            | T            | T            | T            | C       | Y              | A   | A              | G     | G              |
| 155      | C            | C            | C            | C            | C            | C            | C       | C              | C   | C              | T     | Y              |
| 156      | G            | G            | G            | G            | G            | G            | G       | C              | G   | G              | C     | G              |
| 157      | C            | C            | C            | C            | C            | C            | C       | C              | C   | C              | C     | C              |
| 158      | A            | A            | A            | A            | A            | A            | A       | A              | A   | A              | A     | A              |
| 159      | C            | C            | C            | C            | C            | C            | A       | N              | A   | N              | A     | N              |
| 160      | A            | A            | A            | A            | A            | A            | C       | N              | A   | N              | C     | N              |
| 161      | A            | A            | A            | A            | A            | A            | G       | N              | A   | N              | C     | N              |
| 162      | G            | G            | G            | G            | G            | G            | G       | G              | G   | G              | C     | G/C            |
| 163      | T            | T            | T            | T            | T            | T            | G       | T              | T   | T              | T     | T              |
| 164      | G            | G            | G            | G            | G            | G            | A       | G              | A   | A              | G     | A              |
| 165      | T            | T            | T            | T            | T            | T            | C       | T/A            | C   | T/A            | A     | T/A            |
| 166      | G            | T            | G            | T            | G            | G            | G       | G              | G   | G              | T     | T              |
| 167      | T            | T            | T            | T            | T            | T            | C       | T              | A   | C              | A     | N              |
| 168      | C            | T            | C            | T            | C            | C            | T       | N              | T   | C              | A     | N              |
| 169      | T            | T            | T            | T            | T            | T            | G       | G              | G   | N              | A     | N              |
| 170      | T            | T            | T            | T            | T            | T            | G       | G              | A   | G              | A     | R              |
| 171      | G            | G            | G            | G            | G            | G            | T       | A              | G   | T/A            | T     | T              |
| 172      | T            | T            | T            | T            | T            | T            | G       | G              | C/G | G/G            | C/G   | C/G            |
| 173      | C            | C            |              |              |              |              |         |                |     |                |       |                |

**FIG. 7.2 Cont.**

| Position | Tm 12.84-2.2 | Tm 12.84-2.3 | Tm 12.84-3.4 | Tm 12.84-3.9 | Tm 12.84-7.5 | Consensus of | Tm13.17 | Consensus with | B1 | Consensus with | AFP-3 | Consensus with |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|---------|----------------|----|----------------|-------|----------------|
| 236      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | C     | N              |
| 237      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | C     | N              |
| 238      | G            | G            | G            | G            | G            | G            | T       | N              | T  | N              | A     | N              |
| 239      | C            | C            | C            | C            | C            | C            | C       | C              | C  | C              | G     | C/G            |
| 240      | C            | C            | C            | C            | C            | C            | G       | G              | G  | G              | T     | N              |
| 241      | G            | G            | G            | G            | G            | G            | G       | G              | G  | G              | G     | G              |
| 242      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | T     | A/T            |
| 243      | A            | G            | A            | A            | A            | A            | G       | G              | G  | G              | G     | A              |
| 244      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | A              |
| 245      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | A              |
| 246      | C            | C            | C            | C            | C            | C            | G       | C/G            | A  | N              | A     | N              |
| 247      | A            | A            | A            | A            | A            | A            | T       | R              | T  | R              | T     | N              |
| 248      | C            | C            | C            | C            | C            | C            | G       | Y              | T  | Y              | T     | Y              |
| 249      | C            | C            | C            | C            | C            | C            | T       | C/G            | T  | N              | C     | N              |
| 250      | A            | A            | A            | A            | A            | A            | G       | R              | G  | R              | C     | N              |
| 251      | A            | A            | A            | A            | A            | A            | T       | A/T            | A  | A/T            | A     | A/T            |
| 252      | T            | T            | T            | T            | T            | T            | G       | N              | G  | N              | C     | N              |
| 253      | G            | G            | G            | G            | G            | G            | T       | G              | C  | G              | T     | G/C            |
| 254      | T            | T            | T            | T            | T            | T            | C       | T              | C  | Y              | T     | G/C            |
| 255      | G            | G            | G            | G            | G            | G            | G       | G/C            | G  | G/C            | G     | G              |
| 256      | G            | G            | G            | G            | G            | G            | A       | A              | A  | A              | A     | A              |
| 257      | A            | A            | A            | A            | A            | A            | C       | G/C            | C  | G/C            | C     | G/C            |
| 258      | G            | G            | G            | G            | G            | G            | G       | G              | A  | R              | C     | N              |
| 259      | G            | G            | G            | G            | G            | G            | T       | T              | C  | Y              | A     | N              |
| 260      | T            | T            | T            | T            | T            | T            | T       | R              | G  | R              | A     | N              |
| 261      | A            | A            | A            | A            | A            | A            | T       | Y              | T  | Y              | A     | N              |
| 262      | T            | T            | T            | T            | T            | T            | T       | T              | T  | T              | T     | N              |
| 263      | C            | C            | C            | C            | C            | C            | T       | C/G            | C  | C/G            | T     | A              |
| 264      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | A              |
| 265      | A            | A            | A            | A            | A            | A            | A       | R              | R  | R              | G     | R              |
| 266      | A            | A            | A            | A            | A            | A            | G       | G              | G  | G              | A     | R              |
| 267      | A            | A            | A            | A            | A            | A            | G       | G              | A  | N              | C     | R              |
| 268      | G            | G            | G            | G            | G            | G            | A       | N              | G  | A              | C     | N              |
| 269      | C            | C            | C            | C            | C            | C            | C       | C/G            | A  | C/G            | G     | C/G            |
| 270      | C            | C            | C            | C            | C            | C            | A       | A              | A  | A              | A     | A              |
| 271      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | A              |
| 272      | A            | A            | A            | A            | A            | A            | G       | A              | A  | A              | A     | A              |
| 273      | G            | G            | G            | G            | G            | G            | G       | G              | G  | G              | A     | N              |
| 274      | C            | C            | C            | C            | C            | C            | T       | C/G            | T  | T              | T     | T              |
| 275      | T            | T            | T            | T            | T            | T            | G       | T              | G  | N              | C     | G/C            |
| 276      | G            | G            | G            | G            | G            | G            | A       | A              | A  | A              | A     | A              |
| 277      | A            | A            | A            | A            | A            | A            | A       | R              | C  | N              | A     | N              |
| 278      | A            | A            | A            | A            | A            | A            | G       | G              | G  | G              | G     | N              |
| 279      | G            | G            | G            | G            | G            | G            | A       | N              | A  | N              | A     | N              |
| 280      | C            | C            | C            | C            | C            | C            | A       | G              | G  | R              | A     | N              |
| 281      | A            | A            | A            | A            | A            | A            | A       | A              | G  | N              | A     | N              |
| 282      | T            | T            | T            | T            | T            | T            | T       | N              | T  | N              | A     | N              |
| 283      | G            | G            | G            | G            | G            | G            | G       | G              | G  | N              | A     | N              |
| 284      | T            | T            | T            | T            | T            | T            | C       | G/C            | A  | N              | A     | N              |
| 285      | G            | G            | G            | G            | G            | G            | G       | R              | C  | N              | T     | N              |
| 286      | C            | C            | C            | C            | C            | C            | C       | C              | A  | N              | C     | N              |
| 287      | C            | C            | C            | C            | C            | C            | T       | Y              | A  | N              | T     | N              |
| 288      | A            | A            | A            | A            | A            | A            | G       | R              | A  | R              | G     | R              |
| 289      | G            | G            | G            | G            | G            | G            | A       | C              | C  | N              | A     | N              |
| 290      | C            | C            | C            | C            | C            | C            | A       | R              | A  | A              | G     | C/G            |
| 291      | C            | C            | C            | C            | C            | C            | A       | C              | A  | C/G            | G     | R              |
| 292      |              |              |              |              |              |              | A       | A              | A  | A              | G     | A/T            |
| 293      |              |              |              |              |              |              | C       | G              | G  | A/T            | A     | N              |
| 294      |              |              |              |              |              |              | G       | A              | T  | C              | T     | N              |
| 295      | G            | G            | G            | G            | G            | G            | C       | C              | G  | C/G            | G     | C/G            |
| 296      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | R              |
| 297      | C            | C            | C            | C            | C            | C            | G       | C              | T  | C              | G     | R              |
| 298      | G            | G            | G            | G            | G            | G            | A       | A              | A  | A              | A     | A              |
| 299      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | A              |
| 300      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | A              |
| 301      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | A              |
| 302      | G            | G            | G            | G            | G            | G            | R       | R              | A  | R              | A     | A              |
| 303      | G            | G            | G            | G            | G            | G            | G       | Y              | G  | R              | G     | A              |
| 304      | T            | T            | T            | T            | T            | T            | C       | N              | C  | N              | T     | N              |
| 305      | G            | G            | G            | G            | G            | G            | G       | G              | A  | R              | G     | R              |
| 306      | A            | A            | A            | A            | A            | A            | A       | A              | G  | R              | A     | N              |
| 307      | C            | C            | C            | C            | C            | C            | G       | C/G            | A  | N              | T     | N              |
| 308      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | G     | R              |
| 309      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | N              |
| 310      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | N              |
| 311      | G            | G            | G            | G            | G            | G            | A       | A              | A  | T              | C     | N              |
| 312      | A            | A            | A            | A            | A            | A            | T       | R              | T  | A/T            | T     | A/T            |
| 313      | T            | T            | T            | T            | T            | T            | C       | T              | G  | T              | G     | C/G            |
| 314      | C            | C            | C            | C            | C            | C            | C       | R              | T  | C/G            | N     | N              |
| 315      | G            | G            | G            | G            | G            | G            | T       | G              | C  | Y              | T     | Y              |
| 316      | T            | T            | T            | T            | T            | T            | C       | G/C            | G  | G/C            | T     | N              |
| 317      | G            | G            | G            | G            | G            | G            | A       | N              | A  | N              | G     | N              |
| 318      | C            | C            | C            | C            | C            | C            | A       | N              | A  | R              | C     | N              |
| 319      | A            | A            | A            | A            | A            | A            | T       | A              | A  | A              | C     | N              |
| 320      | G            | G            | G            | G            | G            | G            | G       | G              | G  | N              | C     | N              |
| 321      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | N              |
| 322      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | N              |
| 323      | A            | A            | A            | A            | A            | A            | G       | G              | T  | N              | A     | N              |
| 324      | G            | G            | G            | G            | G            | G            | T       | T              | G  | N              | T     | N              |
| 325      | T            | T            | T            | T            | T            | T            | G       | C              | A  | G/C            | G     | G/C            |
| 326      | G            | G            | G            | G            | G            | G            | C       | G              | C  | N              | T     | N              |
| 327      | C            | C            | C            | C            | C            | C            | G       | Y              | C  | G/C            | G     | G/C            |
| 328      | T            | T            | T            | T            | T            | T            | T       | G              | G  | N              | C     | N              |
| 329      | G            | G            | G            | G            | G            | G            | G       | C              | T  | N              | C     | N              |
| 330      | G            | G            | G            | G            | G            | G            | T       | G              | G  | N              | C     | N              |
| 331      | T            | T            | T            | T            | T            | T            | C       | C              | T  | C              | G     | N              |
| 332      | C            | C            | C            | C            | C            | C            | A       | A              | A  | N              | T     | N              |
| 333      | A            | A            | A            | A            | A            | A            | A       | A              | A  | N              | C     | N              |
| 334      | A            | A            | A            | A            | A            | A            | A       | A              | A  | N              | A     | N              |
| 335      | G            | G            | G            | G            | G            | G            | A       | A              | A  | N              | A     | N              |
| 336      | A            | A            | A            | A            | A            | A            | G       | A              | A  | G              | A     | G              |
| 337      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | A              |
| 338      | G            | G            | G            | G            | G            | G            | A       | R              | A  | R              | A     | R              |
| 339      | G            | G            | G            | G            | G            | G            | G       | R              | A  | R              | A     | R              |
| 340      | C            | C            | C            | C            | C            | C            | A       | N              | C  | N              | G     | N              |
| 341      | C            | C            | C            | C            | C            | C            | C       | Y              | A  | N              | A     | N              |
| 342      | C            | C            | C            | C            | C            | C            | A       | C              | C  | Y              | A     | N              |
| 343      | A            | A            | A            | A            | A            | A            | C       | A/T            | T  | N              | T     | N              |
| 344      | C            | C            | C            | C            | C            | C            | C       | C/G            | Y  | C/G            | C     | C/G            |
| 345      | C            | C            | C            | C            | C            | C            | A       | A              | A  | N              | C     | N              |
| 346      | C            | C            | C            | C            | C            | C            | G       | G              | G  | N              | C     | N              |
| 347      | A            | A            | A            | A            | A            | A            | T       | A              | A  | R              | C     | N              |
| 348      | A            | A            | A            | A            | A            | A            | G       | R              | A  | R              | A     | N              |
| 349      | G            | G            | G            | G            | G            | G            | A       | A              | A  | A              | A     | N              |
| 350      | G            | G            | G            | G            | G            | G            | A       | R              | A  | R              | A     | N              |
| 351      | G            | G            | G            | G            | G            | G            | A       | R              | A  | R              | A     | N              |
| 352      | G            | G            | G            | G            | G            | G            | A       | R              | A  | R              | A     | N              |
| 353      | A            | A            | A            | A            | A            | A            | A       | A              | T  | A/T            | A     | A/T            |

FIG. 7.2 Cont.

| Position | Tm 12.84-2.2 | Tm 12.84-2.3 | Tm 12.84-3.4 | Tm 12.84-3.9 | Tm 12.84-7.5 | Consensus of | Tm13.17 | Consensus with | B1 | Consensus with | AFP-3 | Consensus with |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|---------|----------------|----|----------------|-------|----------------|
| 354      | A            | A            | A            | A            | A            | A            | G       | A              | C  | R              | C     | N              |
| 355      | A            | A            | A            | A            | A            | A            | C       | A              | C  | C              | T     | N              |
| 356      | C            | C            | C            | C            | C            | C            | G       | R              | G  | C/G            | C/G   | C/G            |
| 357      | G            | G            | G            | G            | G            | G            | G       | G              | C  | C              | C     | C              |
| 358      | G            | G            | G            | G            | G            | G            | G       | G              | C  | C              | T     | N              |
| 359      | C            | C            | C            | C            | C            | C            | T       | Y              | A  | N              | C     | N              |
| 360      | T            | T            | T            | T            | T            | T            | T       | N              | T  | N              | A     | N              |
| 361      | T            | T            | T            | T            | T            | T            | T       | A              | T  | G              | C     | N              |
| 362      | A            | A            | A            | A            | A            | A            | T       | A/T            | A  | N              | N     | N              |
| 363      | T            | T            | T            | T            | T            | T            | A       | R              | A  | R              | C     | N              |
| 364      | G            | G            | G            | G            | G            | G            | A       | Y              | A  | N              | A     | R              |
| 365      | A            | A            | A            | A            | A            | A            | T       | A              | G  | A              | C     | A              |
| 366      | C            | C            | C            | C            | C            | C            | A       | Y              | T  | A/T            | T     | A/T            |
| 367      | A            | A            | A            | A            | A            | A            | C       | C              | T  | Y              | T     | Y              |
| 368      | C            | C            | C            | C            | C            | C            | T       | Y              | A  | N              | C     | N              |
| 369      | C            | C            | C            | C            | C            | C            | T       | T              | C  | Y              | T     | Y              |
| 370      | T            | T            | T            | T            | T            | T            | T       | T              | A  | Y              | T     | Y              |
| 371      | T            | T            | T            | T            | T            | T            | T       | T              | C  | N              | T     | N              |
| 372      | C            | C            | C            | C            | C            | C            | A       | A              | A  | A              | A     | A              |
| 373      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | A              |
| 374      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | A              |
| 375      | G            | G            | G            | G            | G            | G            | A       | R              | T  | N              | A     | N              |
| 376      | T            | T            | T            | T            | T            | T            | A       | N              | G  | N              | T     | N              |
| 377      | G            | G            | T            | T            | G            | N            | T       | N              | T  | N              | G     | N              |
| 378      | T            | T            | T            | T            | T            | N            | T       | R              | T  | N              | C     | N              |
| 379      | A            | A            | A            | A            | A            | A            | G       | T              | A  | N              | T     | N              |
| 380      | T            | T            | T            | T            | T            | T            | T       | T              | T  | N              | G     | N              |
| 381      | T            | T            | T            | T            | T            | T            | C       | V              | A  | T/A            | T     | T/A            |
| 382      | T            | T            | T            | T            | T            | T            | A       | A              | T  | T              | Y     | Y              |
| 383      | A            | A            | A            | A            | A            | A            | T       | T/A            | T  | T/A            | C     | N              |
| 384      | C            | C            | C            | C            | C            | C            | G       | C/G            | A  | N              | A     | N              |
| 385      | G            | G            | G            | G            | G            | G            | A       | A              | A  | R              | C     | R              |
| 386      | A            | A            | A            | A            | A            | A            | A       | A              | G  | R              | A     | R              |
| 387      | C            | C            | C            | C            | C            | C            | A       | N              | G  | N              | T     | N              |
| 388      | A            | A            | A            | A            | A            | A            | A       | A              | A  | A              | A     | A              |
| 389      | G            | G            | G            | G            | G            | G            | T       | R              | C  | N              | A     | N              |
| 390      | A            | A            | A            | A            | A            | A            | A       | Y              | A  | N              | A     | A              |
| 391      | A            | A            | A            | A            | A            | A            | C       | A              | A  | N              | C     | N              |
| 392      | A            | A            | A            | A            | A            | A            | A       | A              | A  | R              | A     | A              |
| 393      | C            | C            | C            | C            | C            | C            | G       | C              | C  | N              | G     | R              |
| 394      | C            | C            | C            | C            | C            | C            | C       | C              | C  | C              | T     | Y              |
| 395      | T            | T            | T            | T            | T            | T            | A       | T/A            | A  | T/A            | C     | C              |
| 396      |              |              |              |              |              |              |         |                |    |                |       |                |
| 397      | G            | G            | G            | G            | G            | G            | A       | R              | A  | R              |       |                |
| 398      | A            | A            | A            | A            | A            | A            | G       | A              | T  | A/T            |       |                |
| 399      | T            | T            | T            | T            | T            | T            | T       | N              | T  | N              |       |                |
| 400      | T            | T            | T            | T            | T            | T            | T       | T              | C  | Y              |       |                |
| 401      | T            | T            | T            | T            | T            | T            | T       | T              | T  | Y              |       |                |
| 402      | C            | C            | C            | C            | C            | C            | C       | C              | T  | Y              |       |                |
| 403      | T            | T            | T            | T            | T            | T            | T       | T              | T  | Y              |       |                |
| 404      | T            | T            | T            | T            | T            | T            | C       | T              | T  | Y              |       |                |
| 405      | C            | C            | C            | C            | C            | C            | C       | C              | G  | N              |       |                |
| 406      | C            | C            | C            | C            | C            | C            | C       | T/A            | A  | C              |       |                |
| 407      | C            | C            | C            | C            | C            | C            | C       | C              | G  | N              |       |                |
| 408      | C            | C            | C            | C            | C            | C            | C       | T/A            | A  | R</            |       |                |

**FIG. 7.2 Cont.**

| Position | Tm 12 84-2.2 | Tm 12.84-2.3 | Tm 12 84-3.4 | Tm 12.84-3.9 | Tm 12 84-7.5 | Consensus of | Tm13.17 | Consensus with | B1 | Consensus with | AFP-3 | Consensus with |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|---------|----------------|----|----------------|-------|----------------|
| 472      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 473      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 474      | T            | T            | T            | T            | T            | T            | T       | T              |    | T              | T     | T              |
| 475      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 476      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 477      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 478      | G            | G            | G            | G            | G            | G            | G       | G              |    | C              | A     | N              |
| 479      | G            | G            | G            | G            | G            | G            | T       | T              |    | N              | T     | N              |
| 480      | T            | T            | T            | T            | T            | T            | G       | N              |    | N              | T     | N              |
| 481      | A            | A            | A            | A            | A            | A            | T       | N              |    | N              | T     | N              |
| 482      | A            | C            | C            | C            | C            | C            | T       | Y              |    | Y              | A     | A/T            |
| 483      | T            | T            | T            | T            | T            | T            | T       | T              |    | T              | A     | N              |
| 484      | A            | A            | A            | A            | A            | A            | C       | N              |    | T              | G     | A/T            |
| 485      | T            | T            | T            | T            | T            | T            | T       | T              |    | T              | A     | N              |
| 486      | C            | C            | C            | C            | C            | C            | G       | R              |    | R              | A     | R              |
| 487      | G            | G            | G            | G            | G            | G            | T       | T              |    | T              | A     | T/A            |
| 488      | T            | T            | T            | T            | T            | T            | T       | N              |    | N              | A     | N              |
| 489      | T            | T            | T            | T            | T            | T            | G       | N              |    | N              | A     | N              |
| 490      | A            | A            | A            | A            | A            | A            | A       | N              |    | N              | A     | R              |
| 491      | T            | T            | T            | T            | T            | T            | A       | N              |    | N              | A     | N              |
| 492      | G            | G            | G            | G            | G            | G            | A       | A              |    | R              | A     | N              |
| 493      | T            | A            | T            | A            | T            | N            | A       | A              |    | N              | A     | N              |
| 494      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 495      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 496      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 497      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 498      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 499      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 500      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 501      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 502      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 503      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 504      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 505      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 506      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 507      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 508      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 509      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 510      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 511      | A            | A            | A            | A            | A            | A            | A       | A              |    | A              | A     | A              |
| 512      |              |              |              |              |              |              |         |                |    |                |       |                |

FIG. 7.2 Cont.

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| Position | Tm 12.84+2.2 | Tm 12.84+2.3 | Tm 12.84+3.4 | Tm 12.84+3.9 | Tm 12.84+7.5 | Consensus<br>Tm 12.84 | Tm 13.17 | Consensus<br>Tm 13.17 | Tm P-81 | Tm P-82 | Consensus<br>Tm AFP-3 | Consensus<br>Tm AFP-3 | GENERAL<br>CONSENSUS | SUBSTITUTIONS - most to least common |
|----------|--------------|--------------|--------------|--------------|--------------|-----------------------|----------|-----------------------|---------|---------|-----------------------|-----------------------|----------------------|--------------------------------------|
| 1        | M            | M            | M            | M            | M            | K                     | M        | K                     | L       | L       | L                     | L                     | K                    |                                      |
| 2        | K            | K            | K            | K            | K            | L                     | L        | L                     | L       | L       | L                     | L                     | L                    |                                      |
| 3        | L            | L            | L            | L            | L            | L                     | L        | L                     | L       | L       | L                     | L                     | L                    |                                      |
| 4        | L            | L            | L            | L            | L            | L                     | L        | L                     | L       | L       | L                     | L                     | L                    |                                      |
| 5        | C            | C            | C            | C            | C            | C                     | C        | C                     | C       | C       | C                     | C                     | C                    |                                      |
| 6        | F            | F            | F            | F            | F            | F                     | F        | F                     | F       | F       | F                     | F                     | F                    |                                      |
| 7        | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 8        | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 9        | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 10       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 11       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 12       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 13       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 14       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 15       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 16       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 17       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 18       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 19       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 20       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 21       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 22       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 23       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 24       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 25       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 26       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 27       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 28       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 29       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 30       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 31       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 32       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 33       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 34       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 35       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 36       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 37       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 38       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 39       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 40       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 41       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 42       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 43       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 44       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 45       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 46       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 47       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 48       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 49       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 50       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 51       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 52       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 53       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 54       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 55       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 56       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 57       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 58       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 59       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 60       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 61       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 62       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 63       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 64       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 65       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 66       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 67       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 68       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 69       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 70       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 71       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 72       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 73       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 74       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 75       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 76       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 77       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 78       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 79       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 80       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 81       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 82       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 83       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 84       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 85       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 86       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 87       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 88       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 89       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 90       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 91       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 92       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 93       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 94       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 95       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 96       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |
| 97       | A            | A            | A            | A            | A            | A                     | A        | A                     | A       | A       | A                     | A                     | A                    |                                      |

FIG. 7.3

| Position | Tm 12.84-2.2 | Tm 12.84-3.4 | Tm 12.84-3.9 | Tm 12.84-7.5 | Consensus | Tm 13.17 | Consensus   | Tm P-81 | Tm P-82 | Consensus   | Tm AFP-3 | Consensus   | GENERAL | SUBSTITUTIONS - most to least common |
|----------|--------------|--------------|--------------|--------------|-----------|----------|-------------|---------|---------|-------------|----------|-------------|---------|--------------------------------------|
| 98       | V            | V            | V            | V            | V         | T        | ALP/ALH     | S       | S       | ALP/ALH     | V        | V           | V       | S                                    |
| 99       | D            | D            | D            | D            | D         | E        | ACD         | E       | E       | ACD         | D        | D           | D       | D                                    |
| 100      | K            | K            | K            | K            | K         | K        | K           | K       | K       | K           | K        | K           | K       | K                                    |
| 101      | I            | I            | I            | I            | I         | I        | I           | I       | I       | I           | L        | I           | I       | L                                    |
| 102      | V            | V            | V            | V            | V         | I        | ALP         | V       | V       | ALP         | V        | ALP         | V       | I                                    |
| 103      | Q            | Q            | Q            | Q            | Q         | K        | ACD         | K       | K       | ACD         | V        | ACD         | V       | K                                    |
| 104      | K            | K            | K            | K            | K         | K        | C           | K       | K       | C           | C        | C           | C       | E                                    |
| 105      | C            | C            | C            | C            | C         | C        | C           | C       | C       | C           | K        | C           | C       | A                                    |
| 106      | V            | V            | V            | V            | V         | V        | ALP         | T       | T       | ALP         | V        | ALP         | V       | A                                    |
| 107      | V            | V            | V            | V            | V         | K        | V           | T       | T       | V           | A        | V           | V       | T                                    |
| 108      | K            | K            | K            | K            | K         | K        | BAS         | E       | E       | HY-ACD/ALH  | K        | HY-ACD/ALH  | K       | T                                    |
| 109      | K            | K            | K            | K            | K         | R        | ALP/ACD     | T       | T       | HY-ACD/ALH  | K        | HY-ACD/ALH  | K       | R                                    |
| 110      | A            | A            | A            | A            | A         | D        | ALP/ACD     | D       | D       | HY-ACD/ALH  | K        | HY-ACD/ALH  | K       | A                                    |
| 111      | T            | T            | T            | T            | T         | V        | ALP         | E       | E       | ALP         | T        | ALP         | T       | V                                    |
| 112      | P            | P            | P            | P            | P         | E        | ALP         | T       | T       | ACD         | T        | ACD         | T       | O                                    |
| 113      | E            | E            | E            | E            | E         | E        | ACD         | H       | H       | HY-ACD/ALH  | E        | HY-ACD/ALH  | E       | D                                    |
| 114      | A            | A            | A            | A            | A         | T        | ALP         | T       | T       | ALH         | E        | ALH         | E       | S                                    |
| 115      | T            | T            | T            | T            | T         | T        | ALP         | T       | T       | ALH         | T        | ALH         | T       | S                                    |
| 116      | Y            | Y            | Y            | Y            | Y         | A        | ARO         | F       | F       | ARO         | A        | ARO         | A       | Y                                    |
| 117      | T            | T            | T            | T            | T         | F        | ASX         | E       | E       | ACD         | D        | ACD         | D       | F                                    |
| 118      | D            | D            | D            | D            | D         | N        | T           | F       | F       | ALH/ALP/ARO | F        | ALH/ALP/ARO | F       | N                                    |
| 119      | T            | T            | T            | T            | T         | T        | T           | T       | T       | ALH/ALP/ARO | T        | ALH/ALP/ARO | T       | F                                    |
| 120      | F            | F            | F            | F            | F         | K        | F           | K       | K       | ALH/ALP/ARO | K        | ALH/ALP/ARO | K       | T                                    |
| 121      | K            | K            | K            | K            | K         | K        | HY-SUL/ALP  | C       | C       | HY-SUL/ALP  | K        | HY-SUL/ALP  | K       | T                                    |
| 122      | C            | C            | C            | C            | C         | C        | HY-SUL/ALP  | C       | C       | HY-SUL/ALP  | C        | HY-SUL/ALP  | C       | V                                    |
| 123      | I            | I            | I            | I            | I         | I        | ALP         | V       | V       | ALP         | I        | ALP         | I       | I                                    |
| 124      | Y            | Y            | Y            | Y            | Y         | M        | ARO/SUL/ALP | L       | L       | ARO/SUL/ALP | Y        | ARO/SUL/ALP | Y       | L                                    |
| 125      | D            | D            | D            | D            | D         | K        | HY-ACD/ALH  | L       | L       | HY-ACD/ALH  | Y        | HY-ACD/ALH  | Y       | L                                    |
| 126      | S            | S            | S            | S            | S         | N        | HY-ALH/ACD  | D       | D       | HY-ALH/ACD  | S        | HY-ALH/ACD  | S       | N                                    |
| 127      | K            | K            | K            | K            | K         | K        | K           | K       | K       | K           | N        | K           | N       | R                                    |
| 128      | K            | K            | K            | K            | K         | K        | K           | K       | K       | K           | S        | K           | S       | R                                    |
| 129      | P            | P            | P            | P            | P         | P        | P           | P       | P       | P           | R        | P           | R       | S                                    |
| 130      | D            | D            | D            | D            | D         | K        | HY-ACD/ALH  | F       | F       | HY-ACD/ALH  | R        | HY-ACD/ALH  | R       | S                                    |
| 131      | F            | F            | F            | F            | F         | F        | HY-ACD/ALH  | F       | F       | HY-ACD/ALH  | P        | HY-ACD/ALH  | P       | K                                    |
| 132      | S            | S            | S            | S            | S         | S        | ALH/ARO     | F       | F       | ALH/ARO     | F        | ALH/ARO     | F       | N                                    |
| 133      | P            | P            | P            | P            | P         | P        | ALP         | G       | G       | ALP         | P        | ALP         | P       | F                                    |
| 134      | P            | P            | P            | P            | P         | P        | ACD/ALP     | L       | L       | ACD/ALP     | P        | ACD/ALP     | P       | G                                    |
| 135      | I            | I            | I            | I            | I         | D        | F OR GAP    | F       | F       | V, OR GAP   | V        | V, OR GAP   | V       | D                                    |
| 136      | D            | D            | D            | D            | D         | D        | V, OR GAP   | V       | V       | V, OR GAP   | F        | V, OR GAP   | F       | L                                    |
| 137      | I            | I            | I            | I            | I         | I        |             |         |         |             |          |             |         |                                      |
| 138      | D            | D            | D            | D            | D         | D        |             |         |         |             |          |             |         |                                      |

FIG. 7.3 Cont.

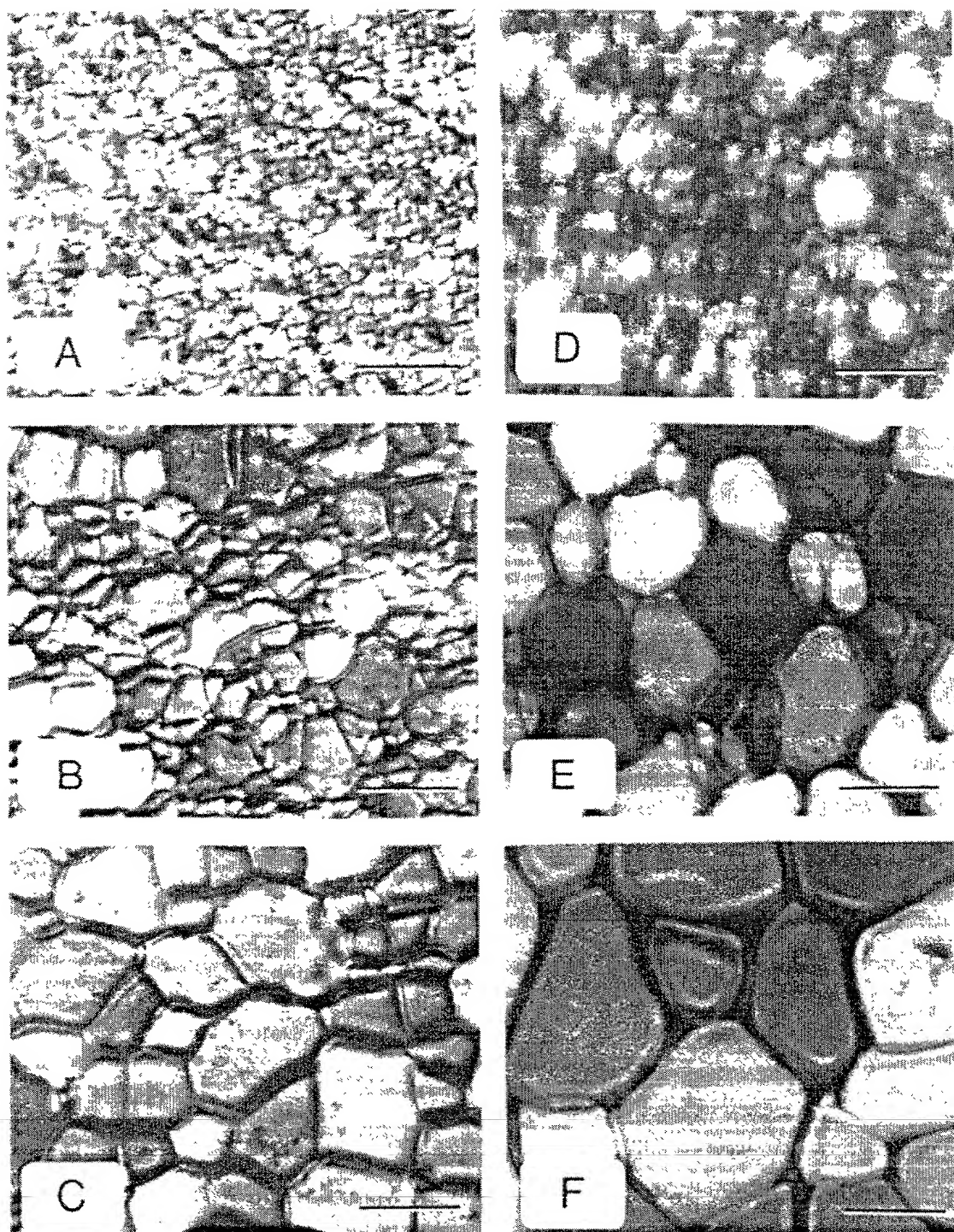


FIG. 8.0

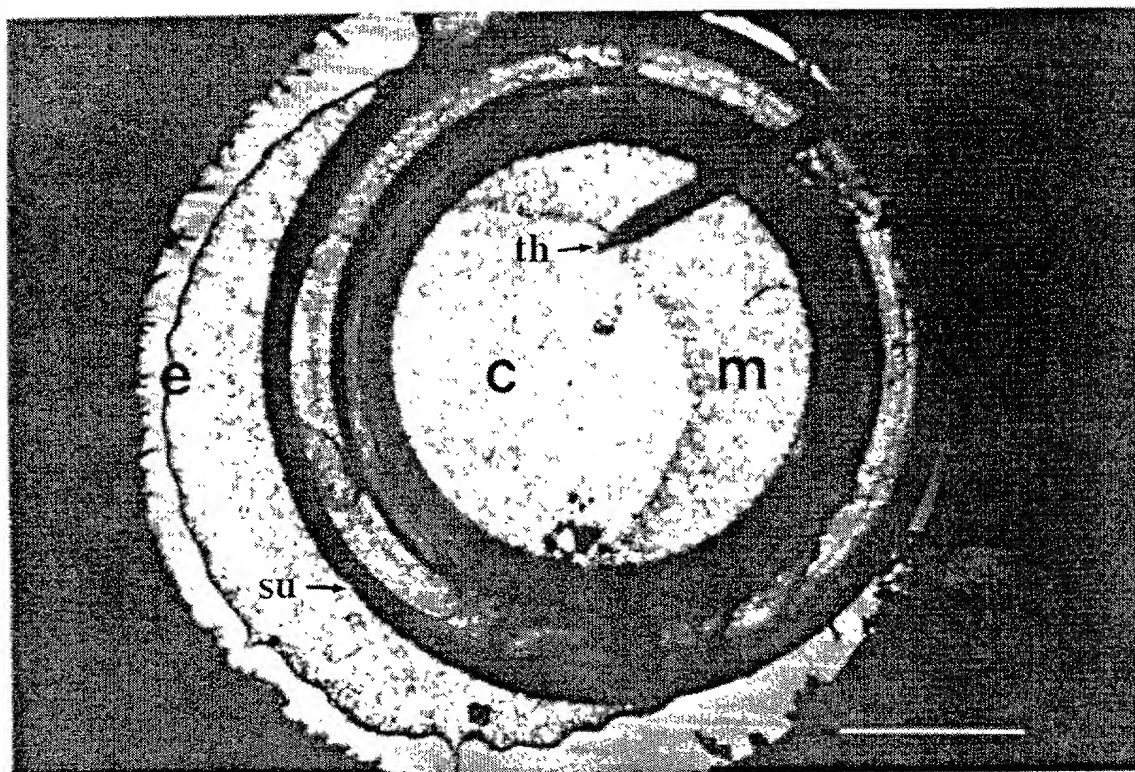


FIG. 8.1a

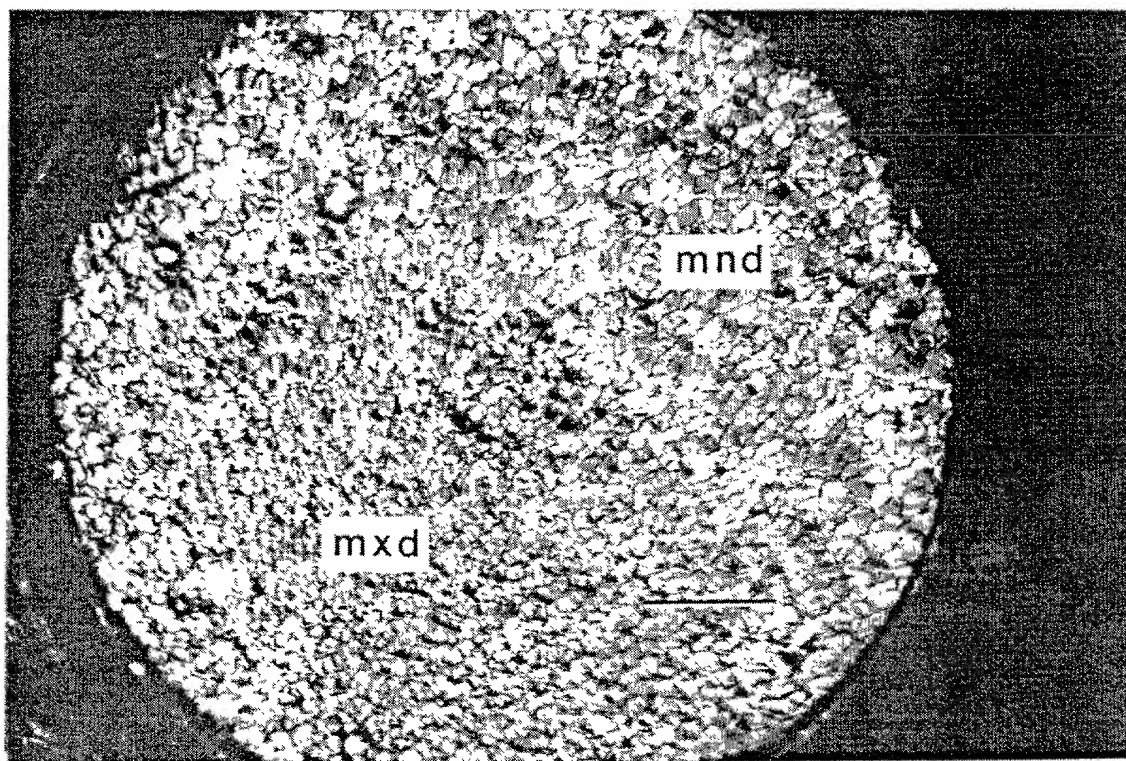


FIG. 8.1b

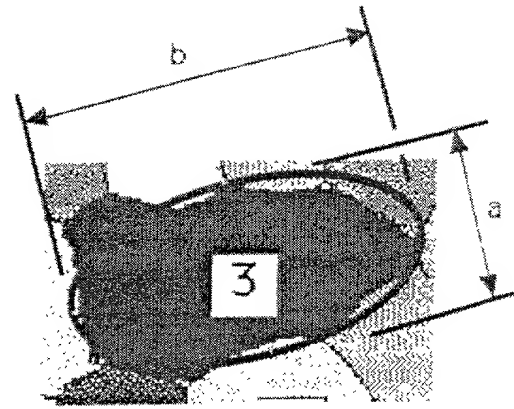


FIG. 8.2

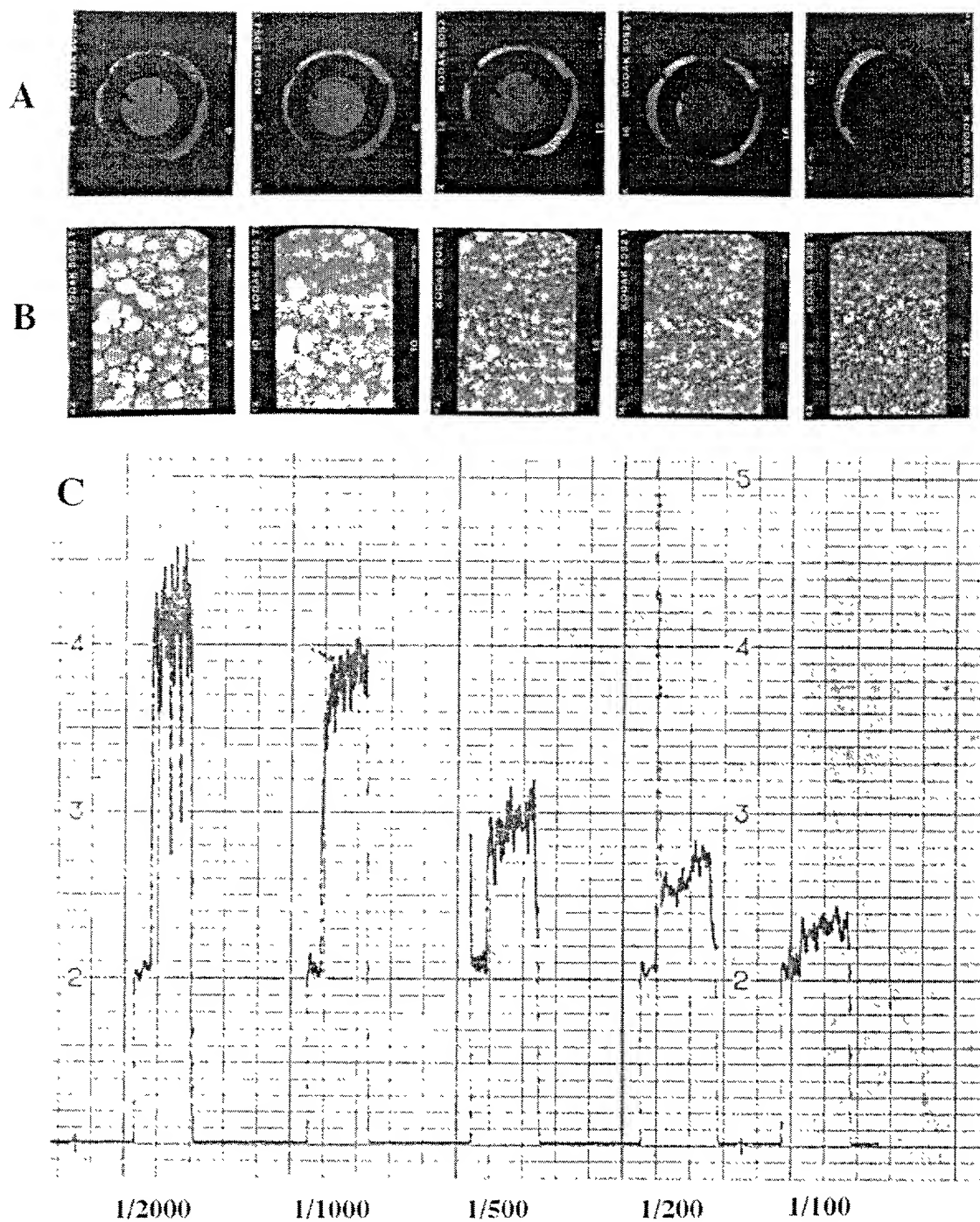


FIG. 8.3

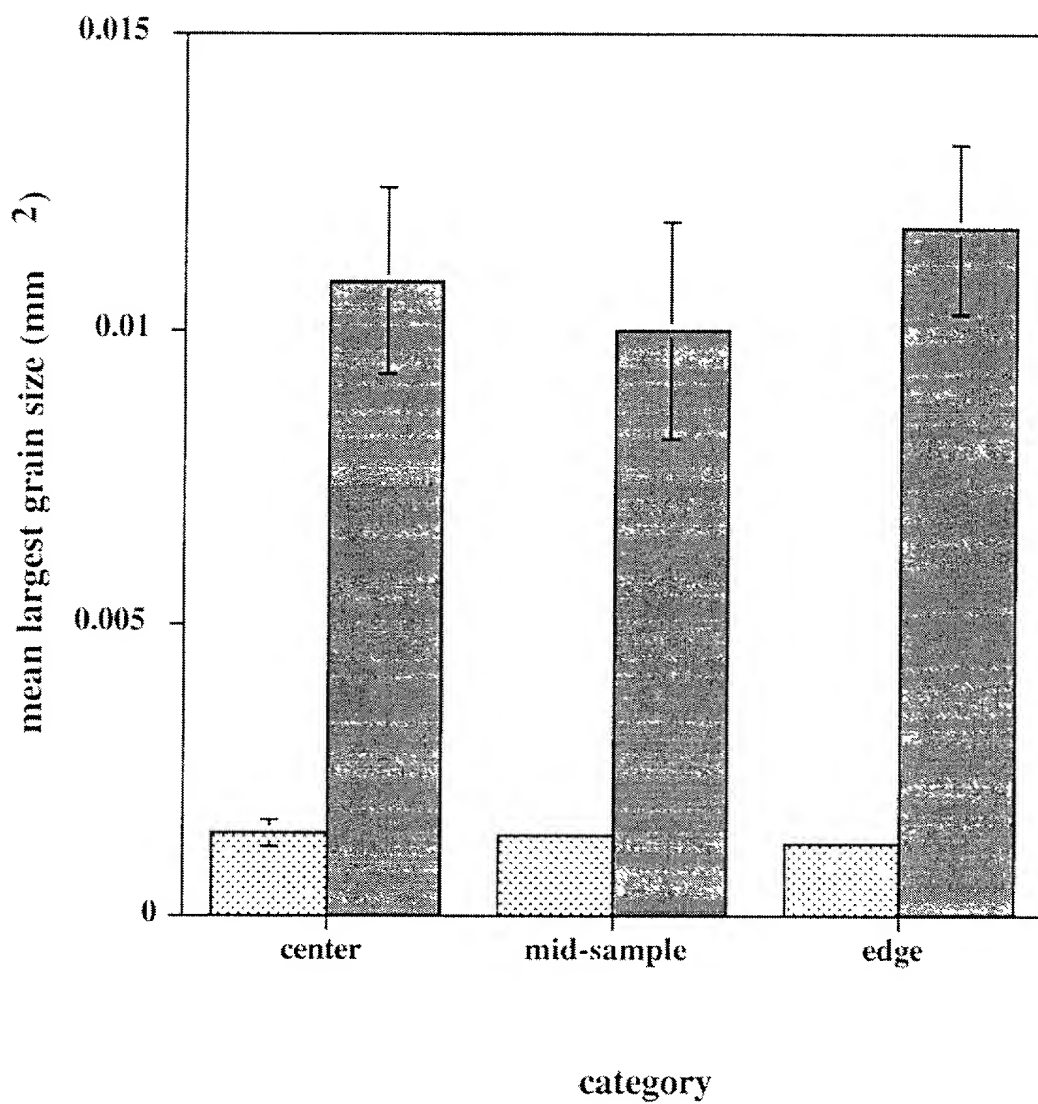


FIG. 8.4a

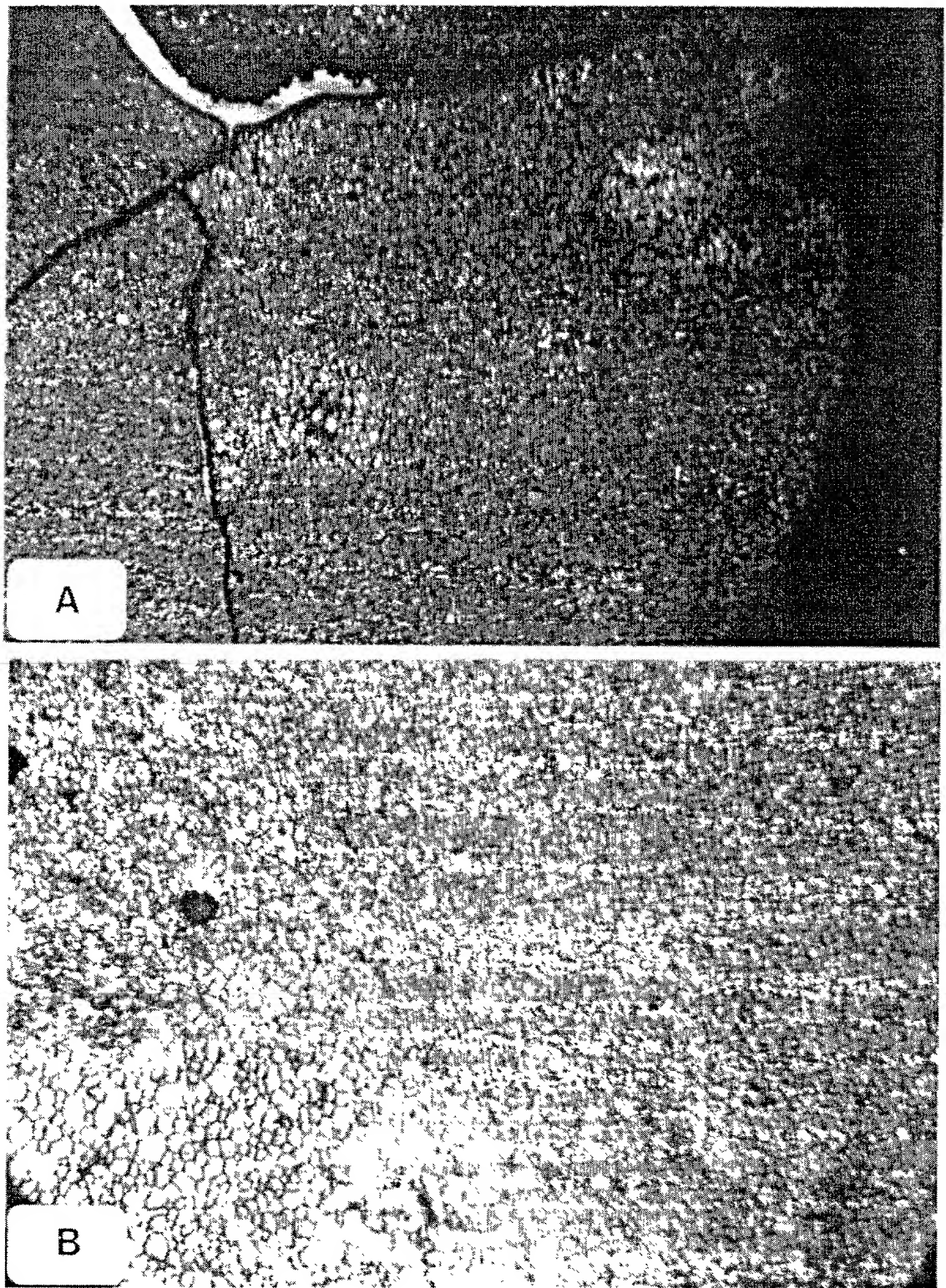


FIG. 8.4b

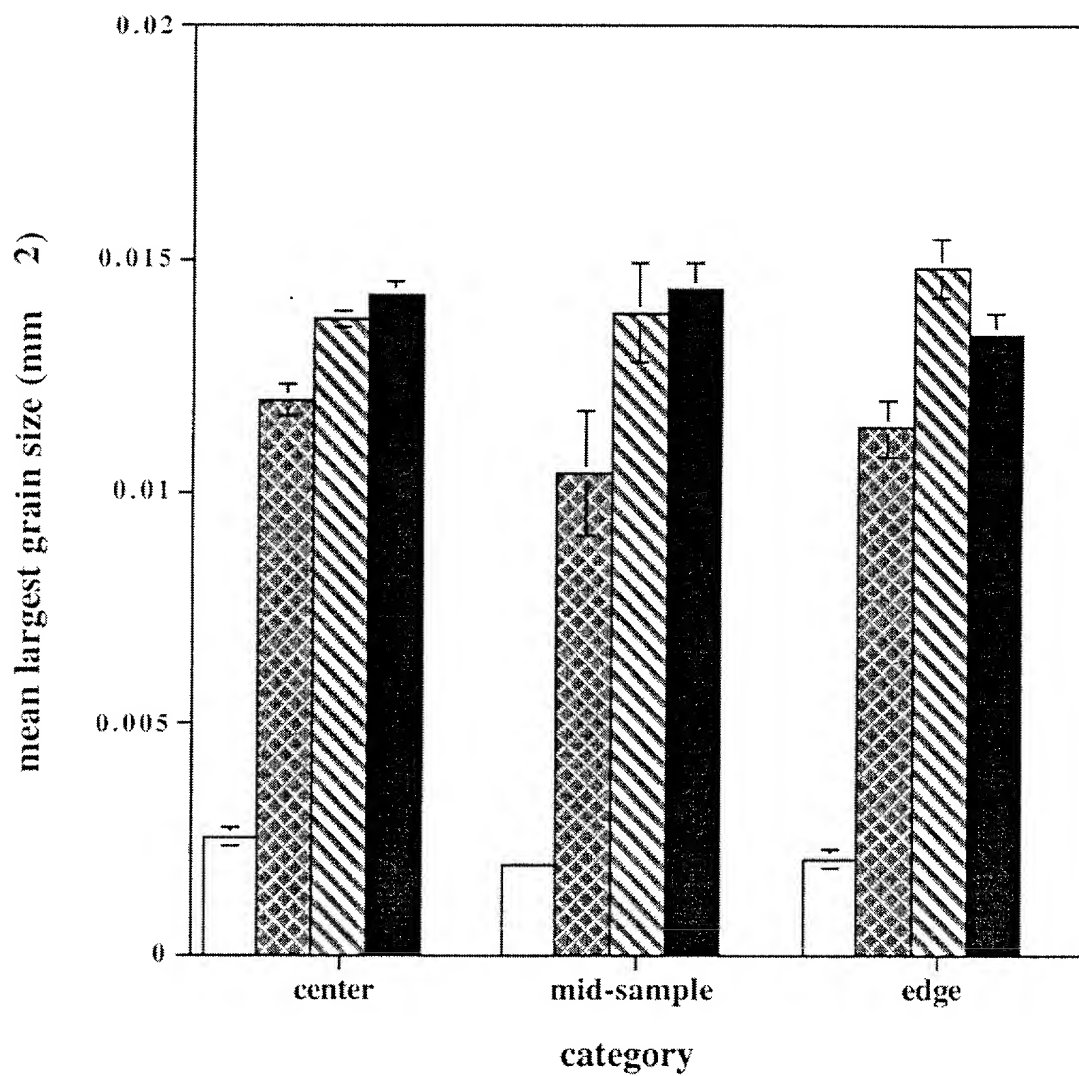


FIG. 8.5a

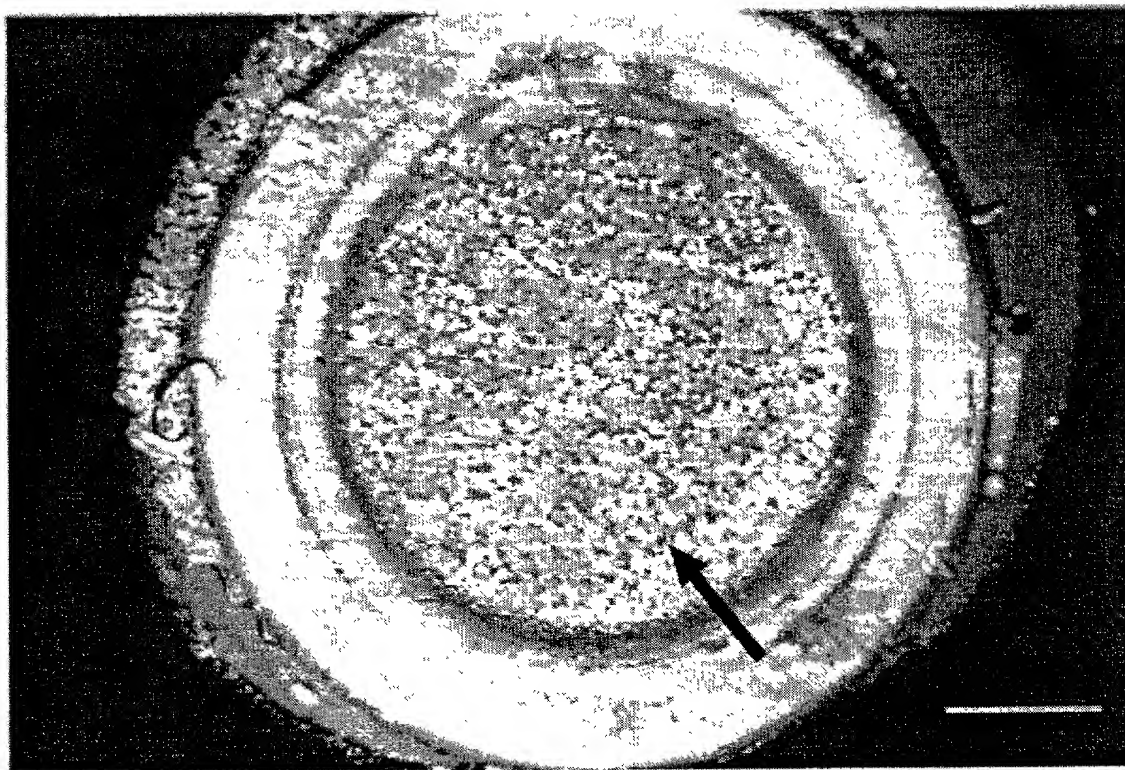


FIG. 8.5b

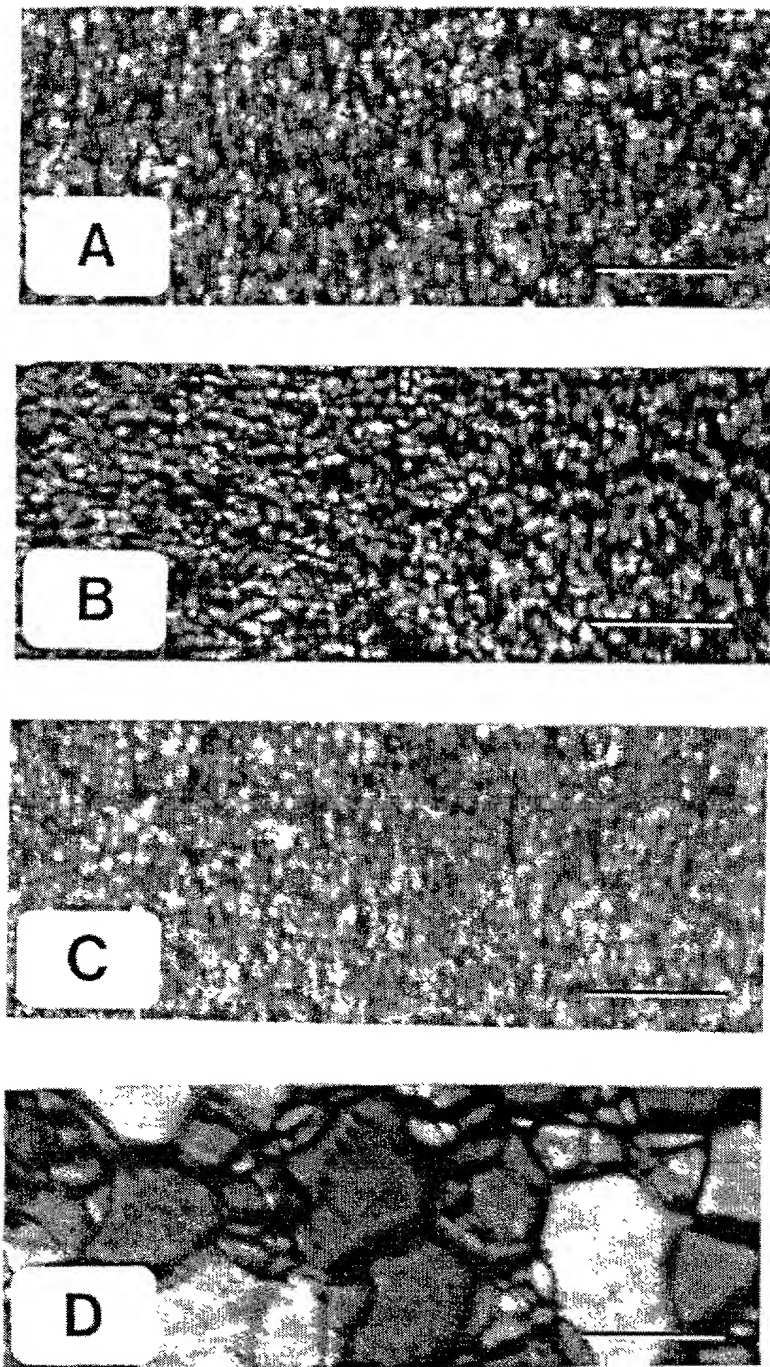


FIG. 8.6

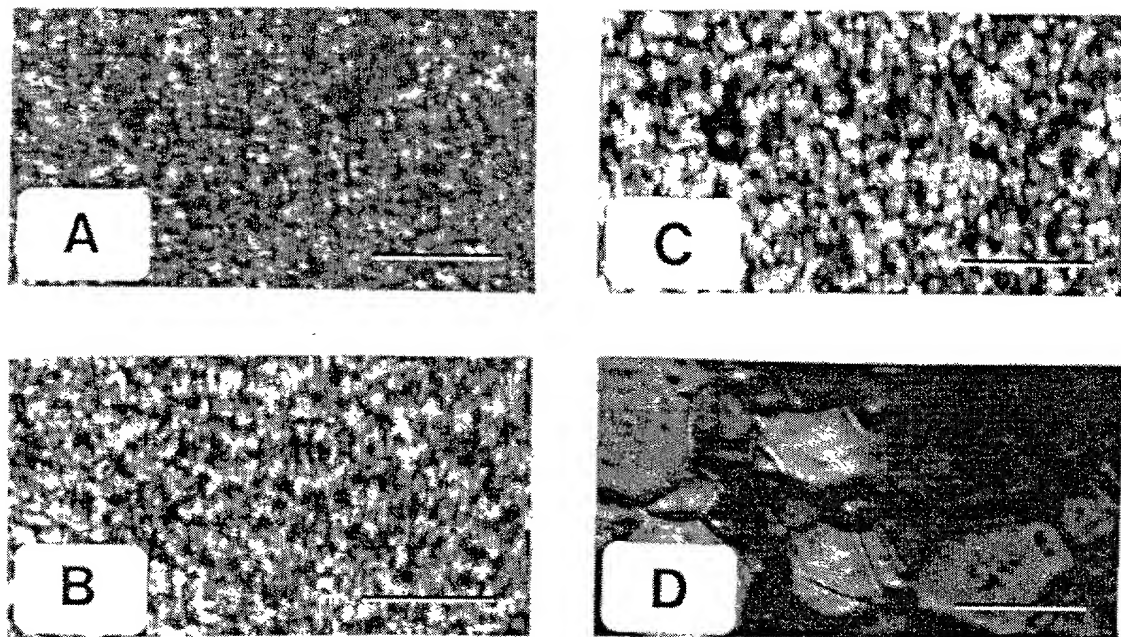


FIG. 8.7

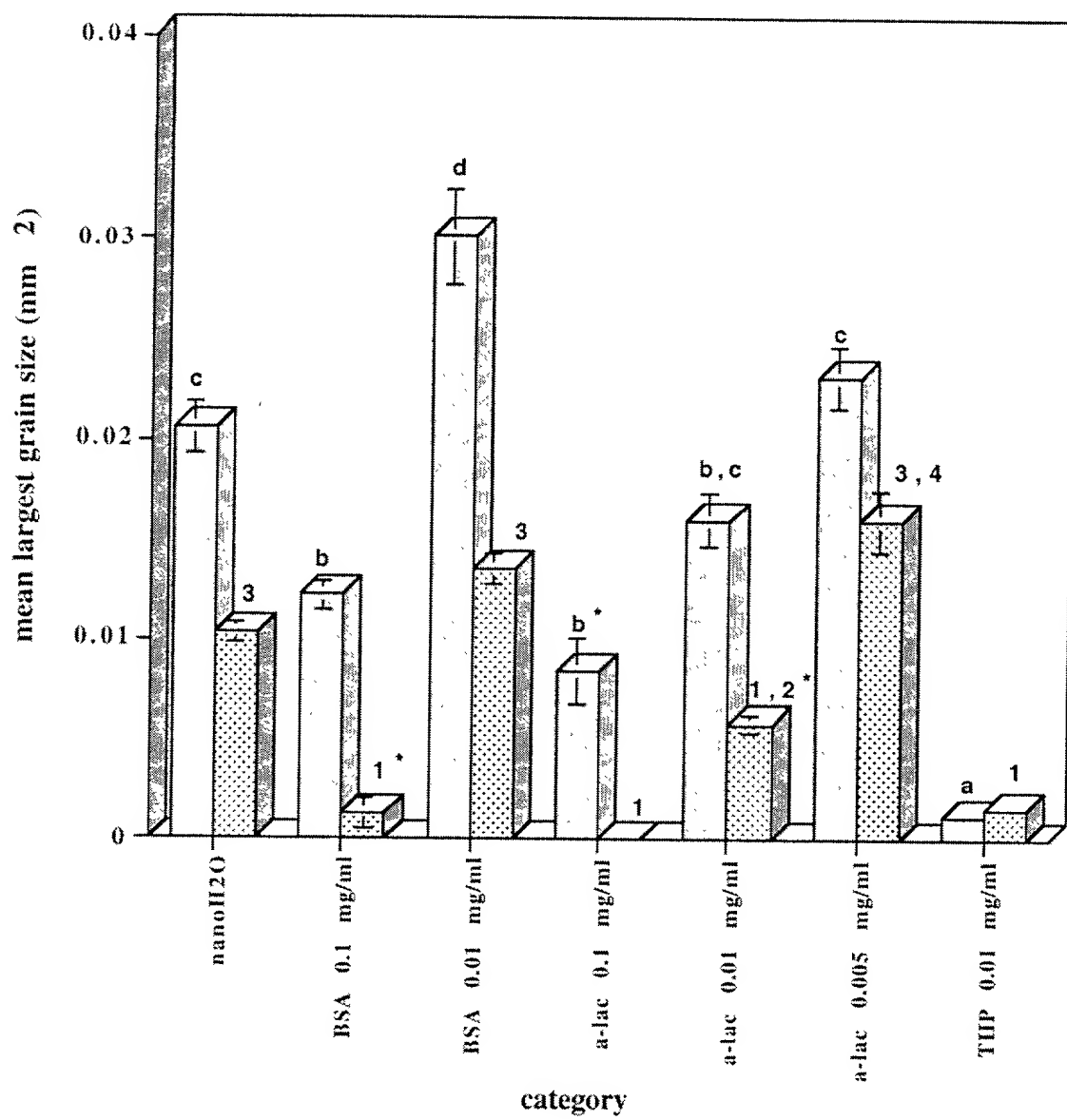


FIG. 8.8

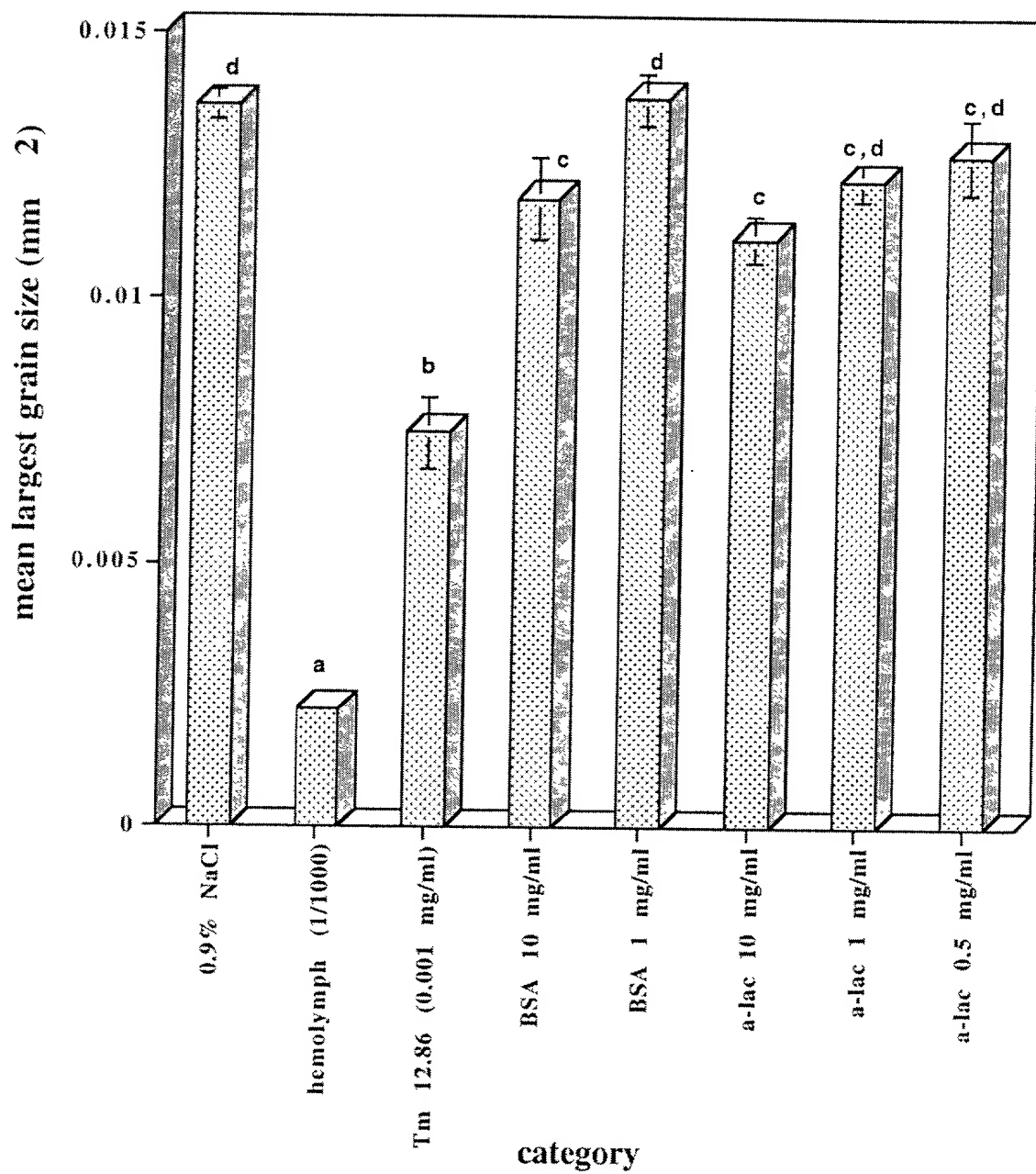


FIG. 8.9

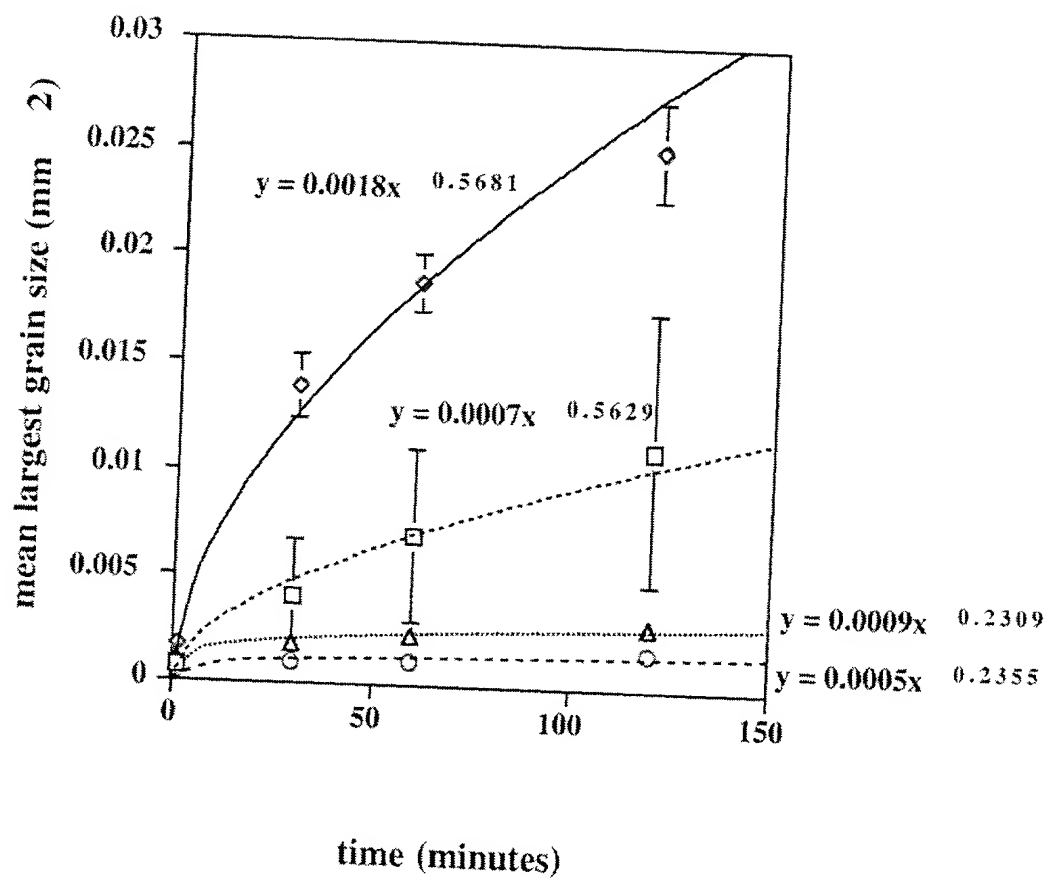


FIG. 8.10

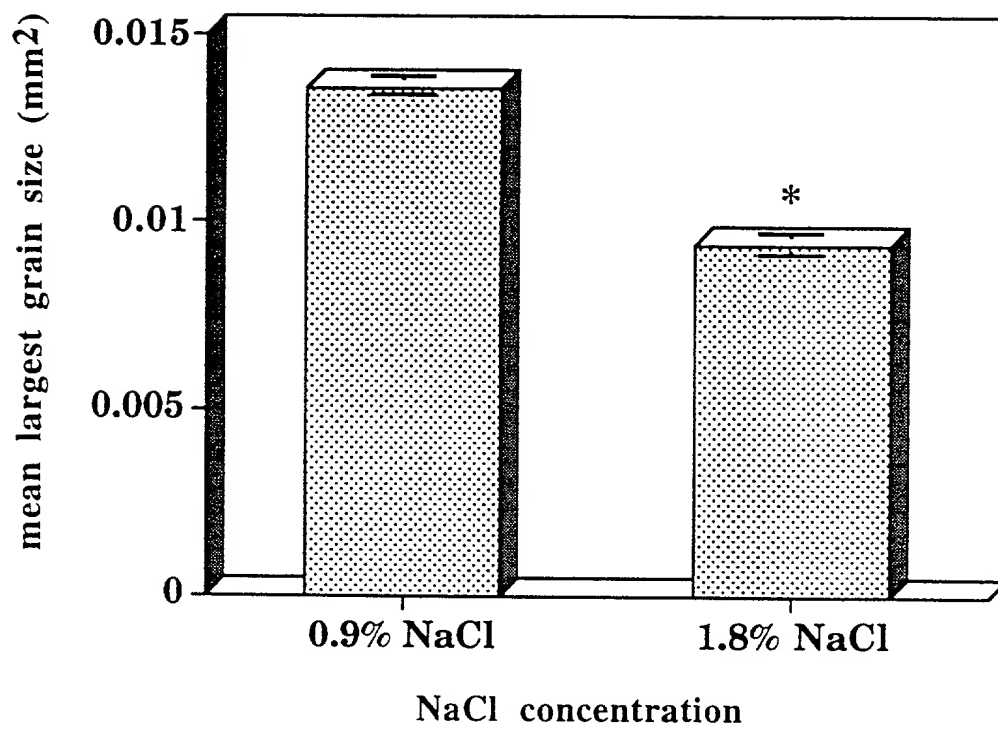


FIG. 8.11

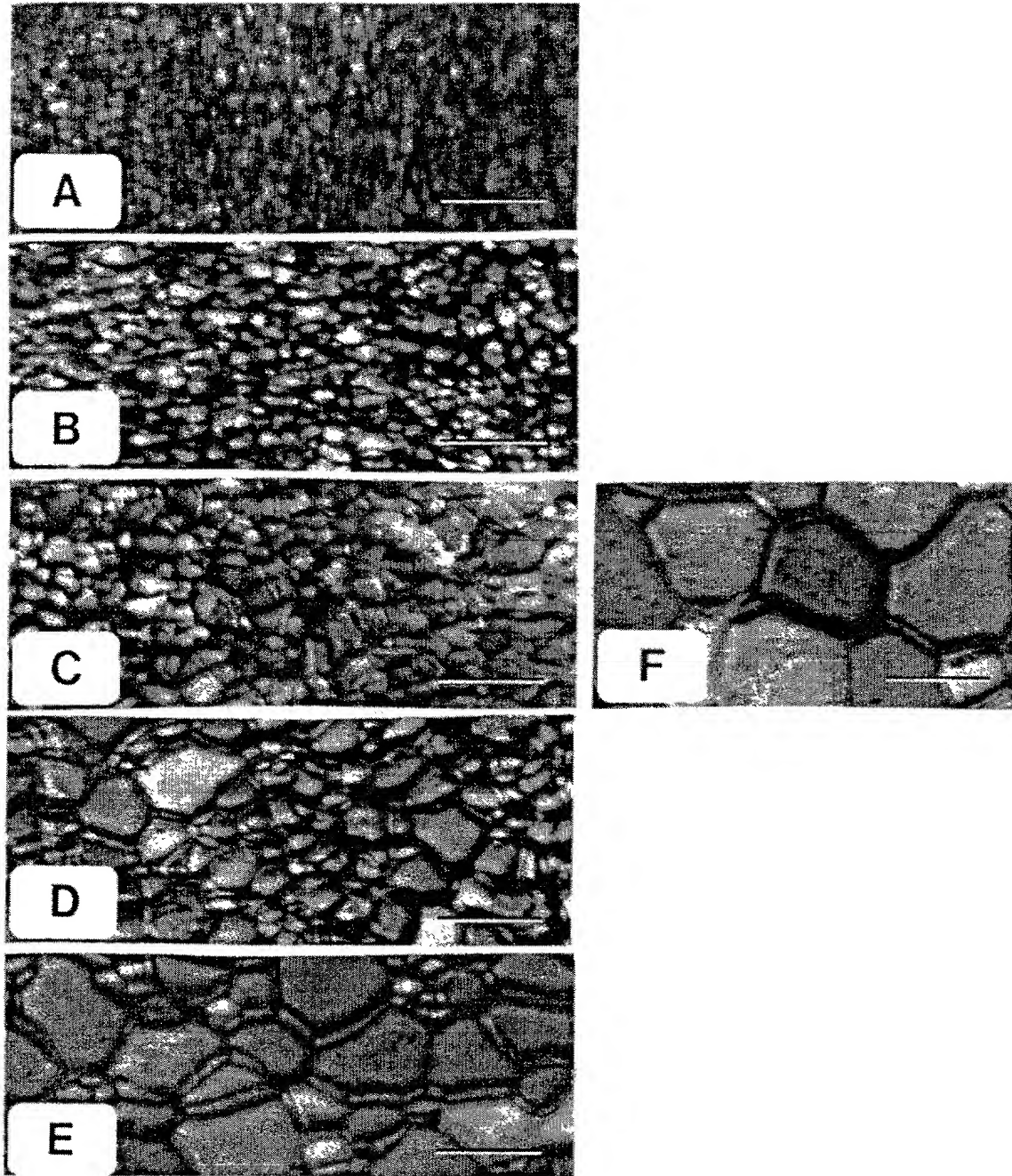


FIG. 8.12

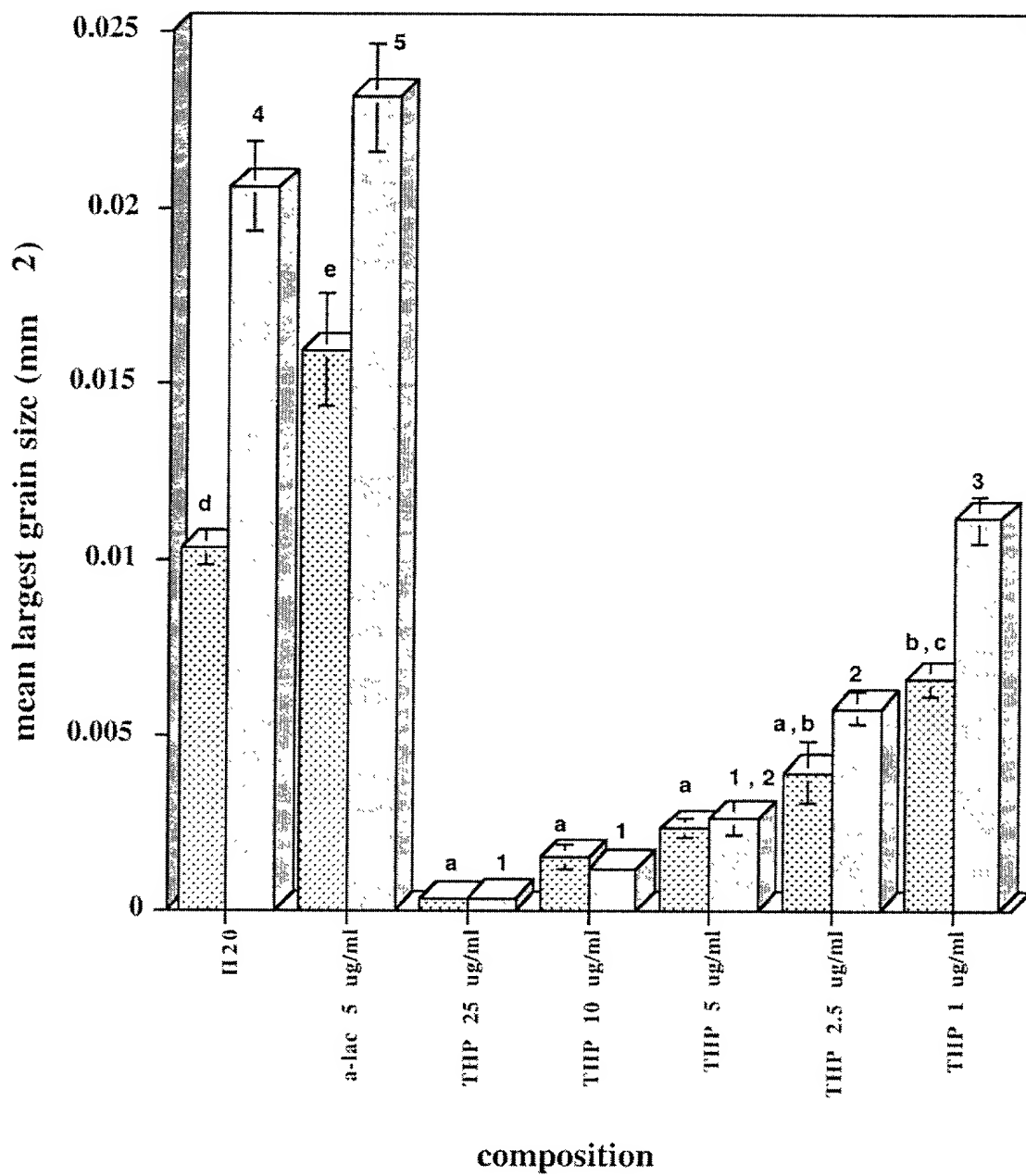


FIG. 8.13



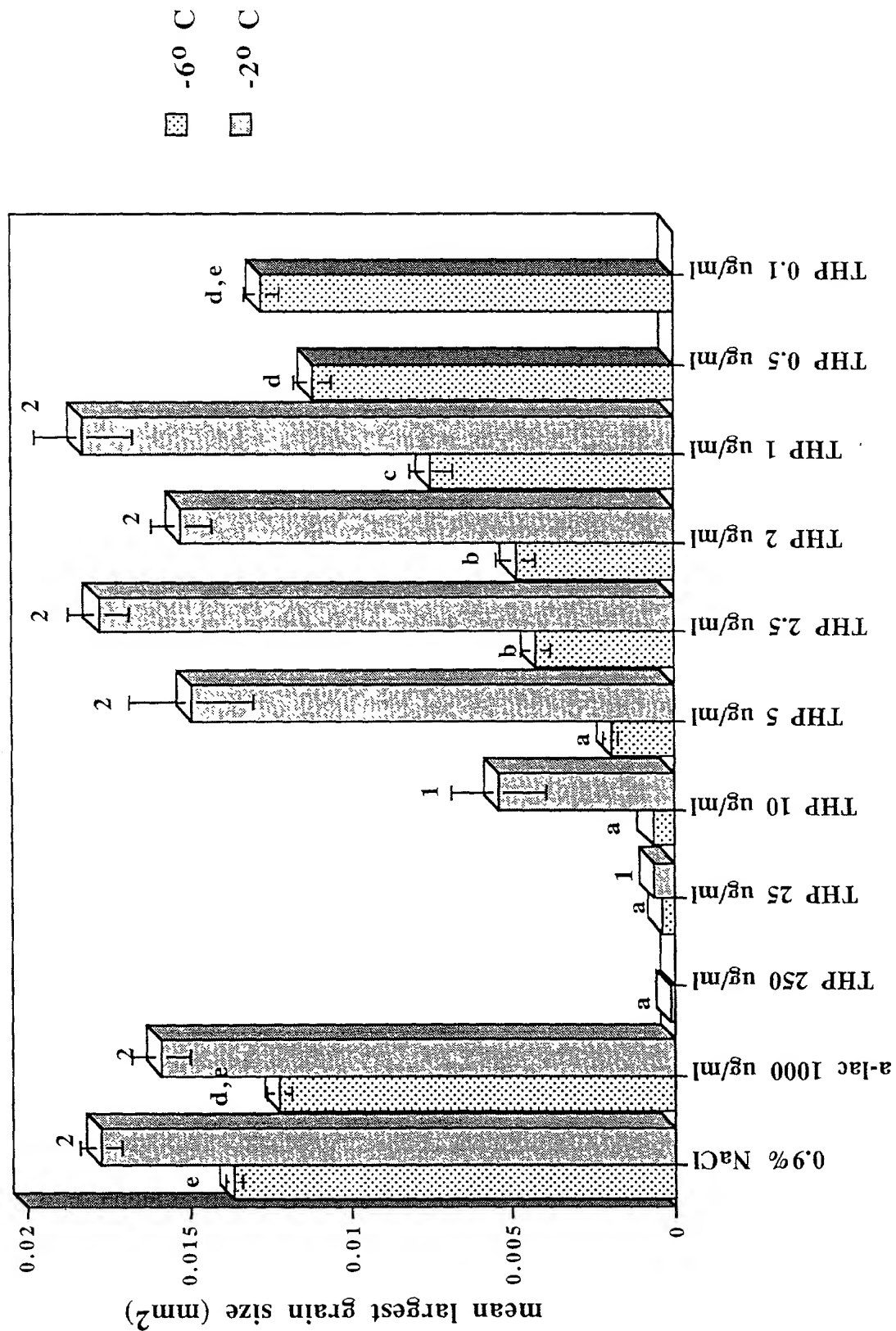


FIG. 8.15

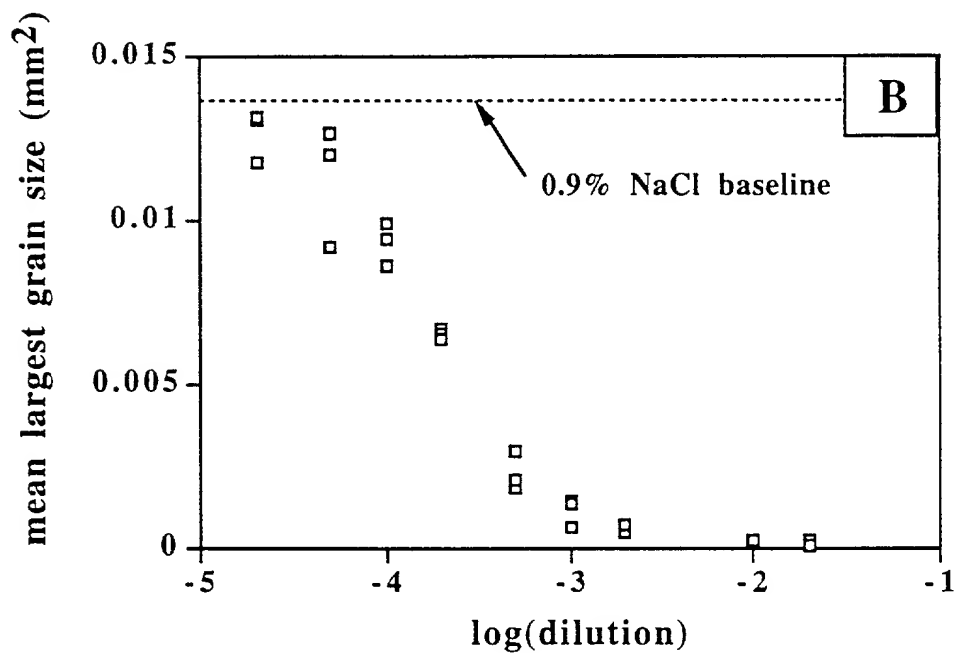
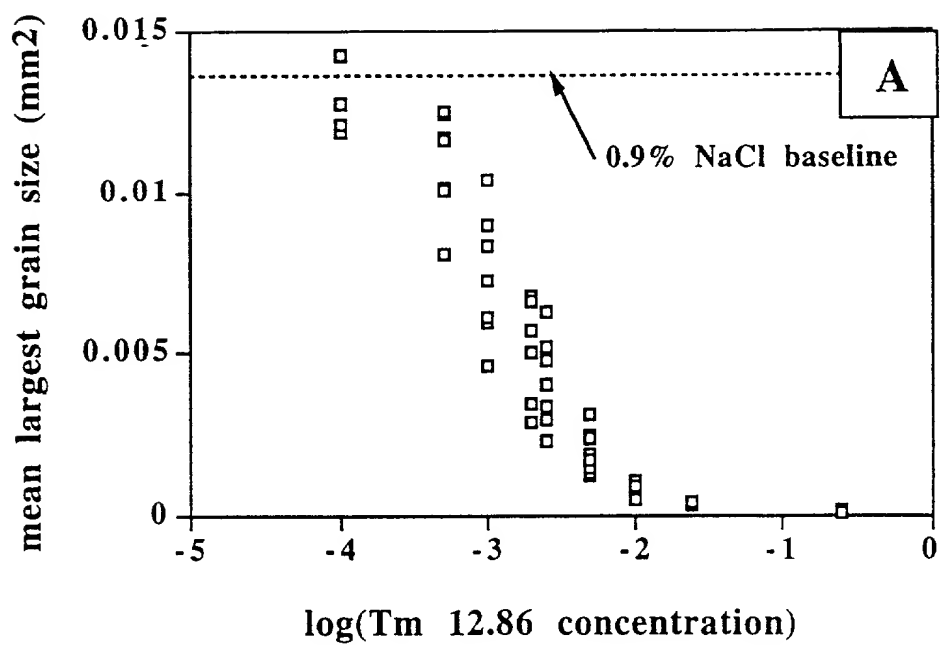


FIG. 8.16

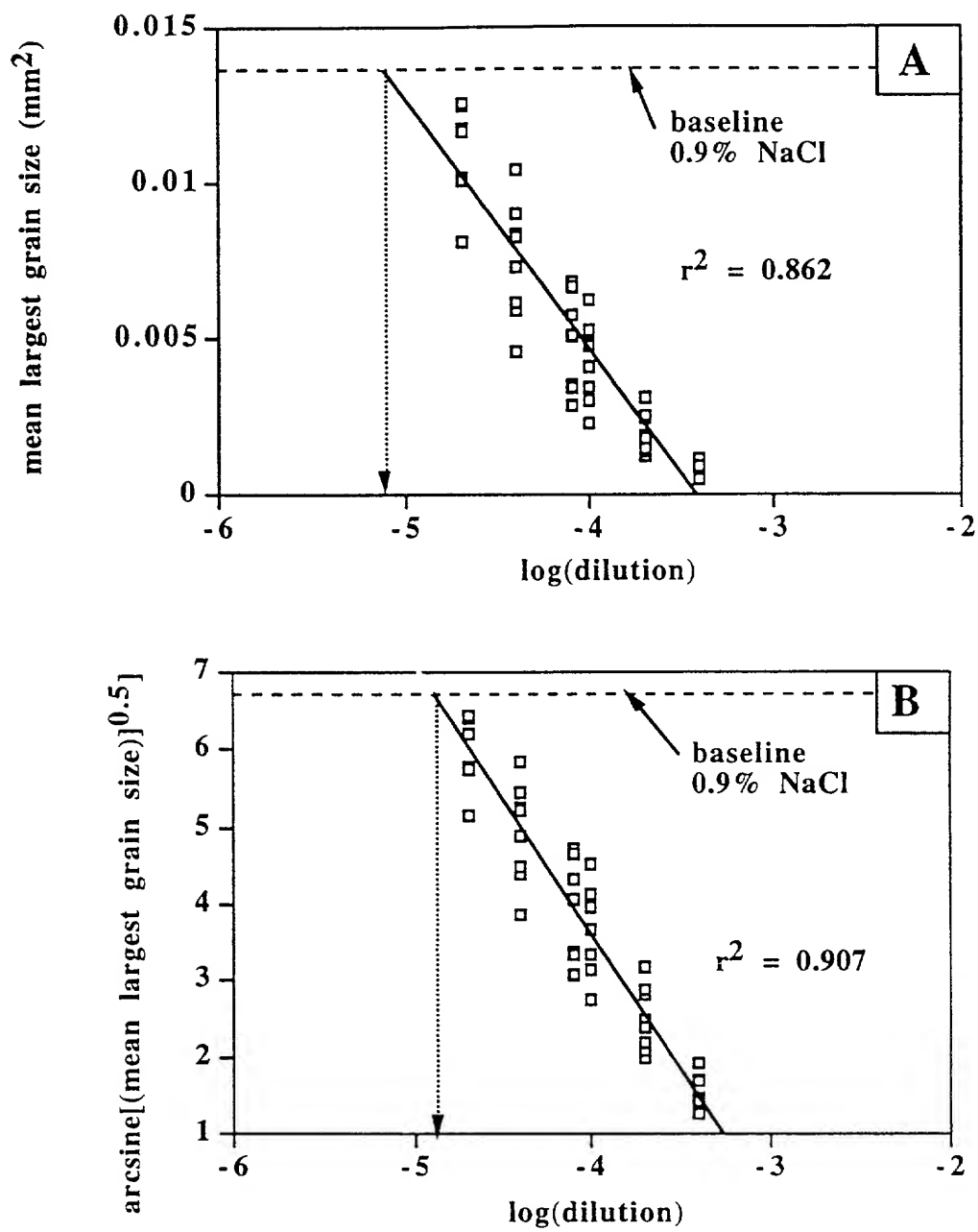


FIG. 8.17

102090" 04692860 0987348 080701

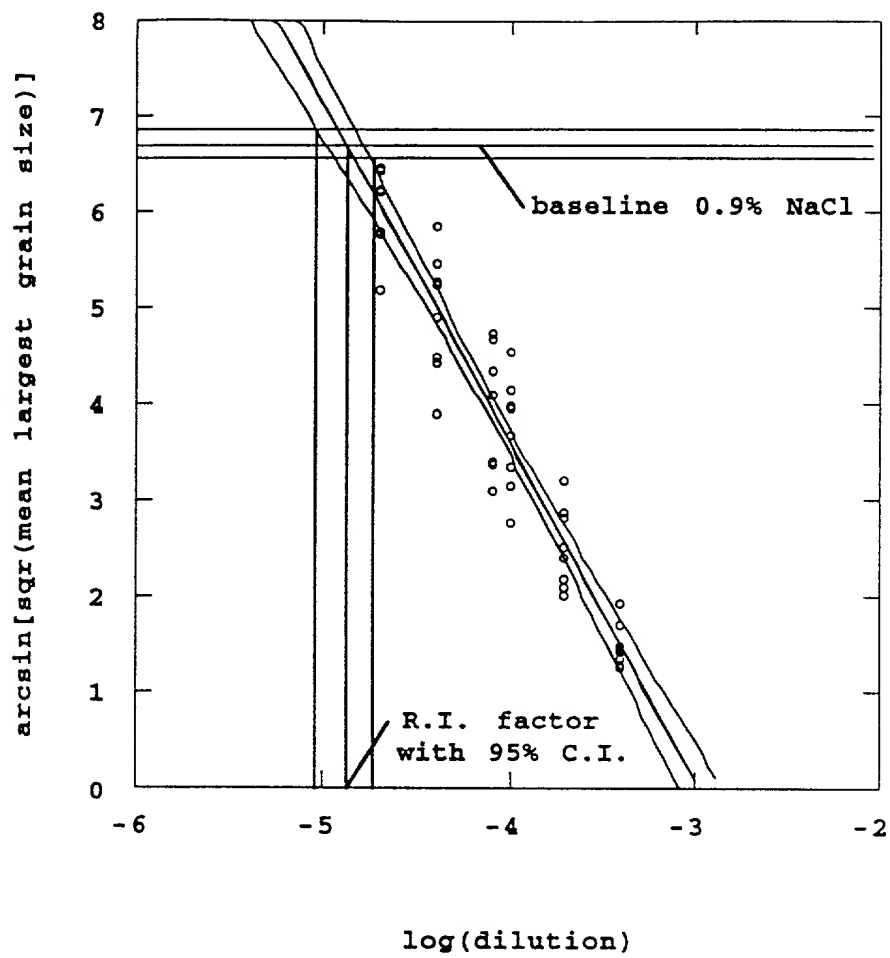


FIG. 8.18

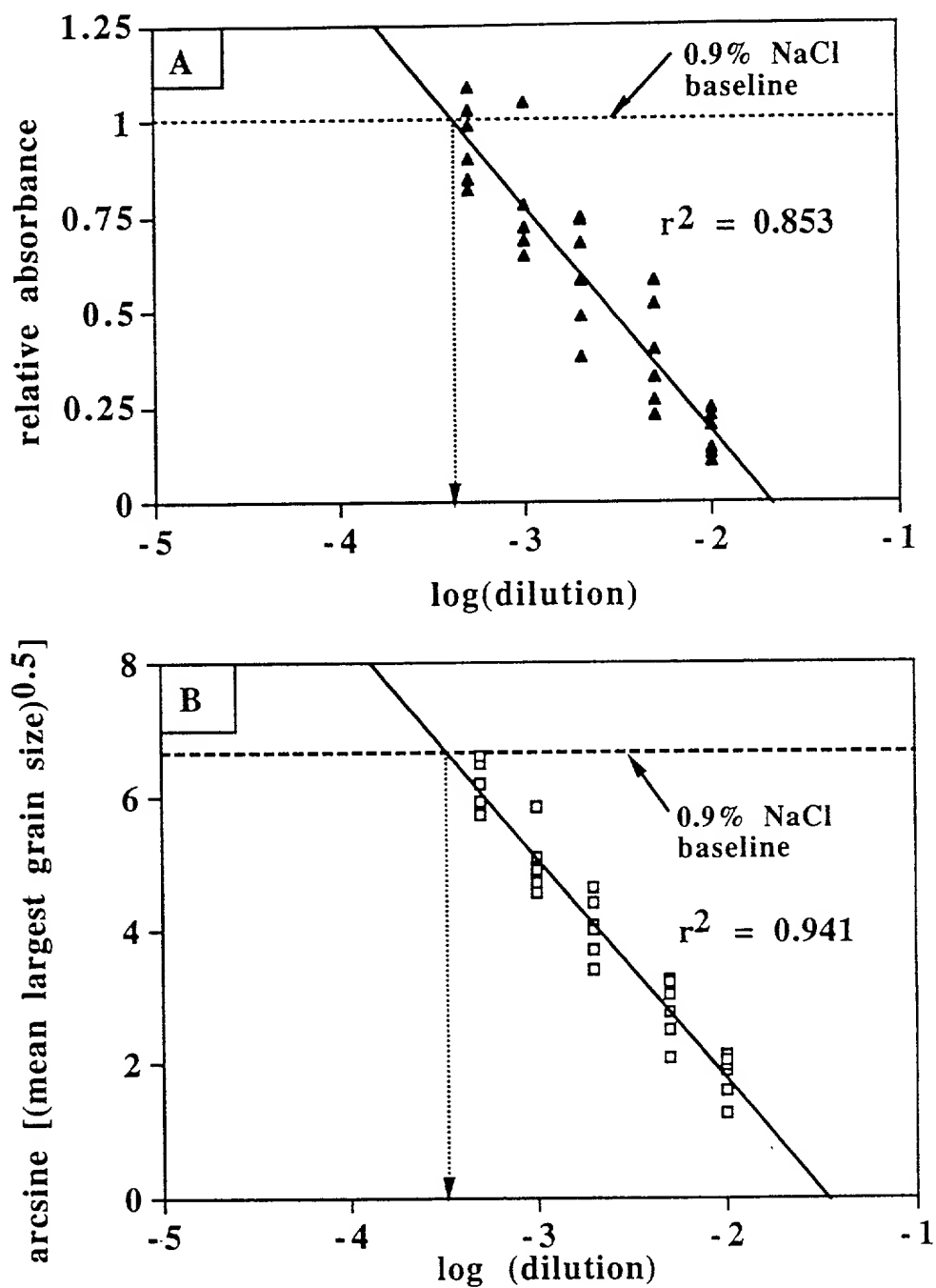


FIG. 8.19

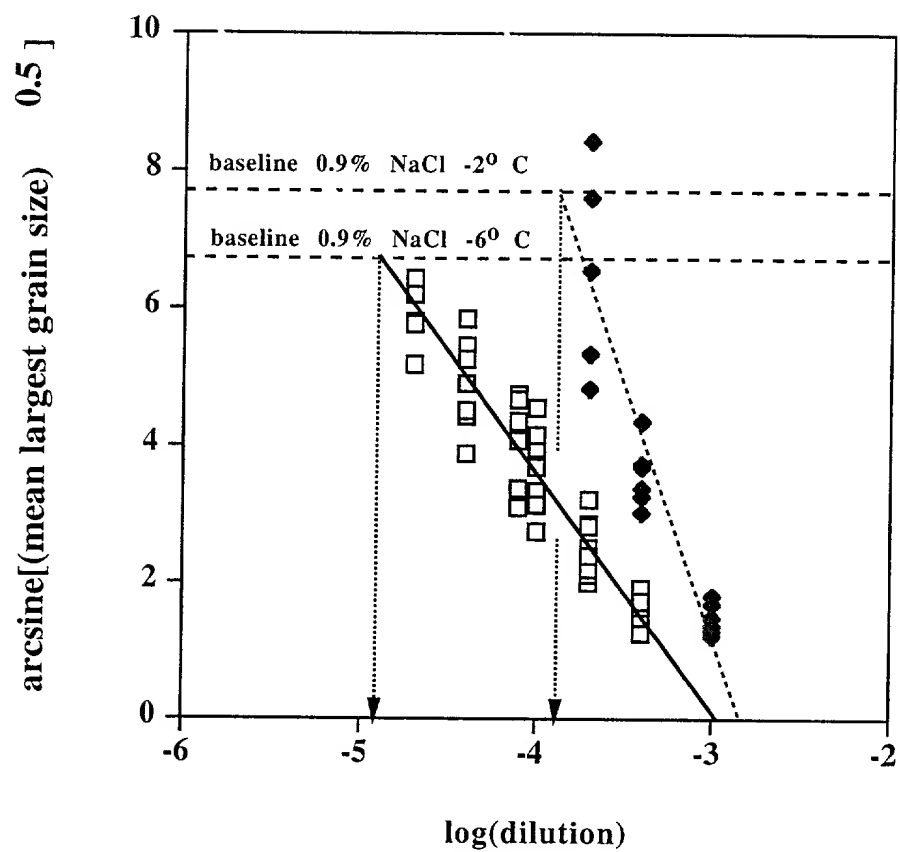


FIG. 8.20

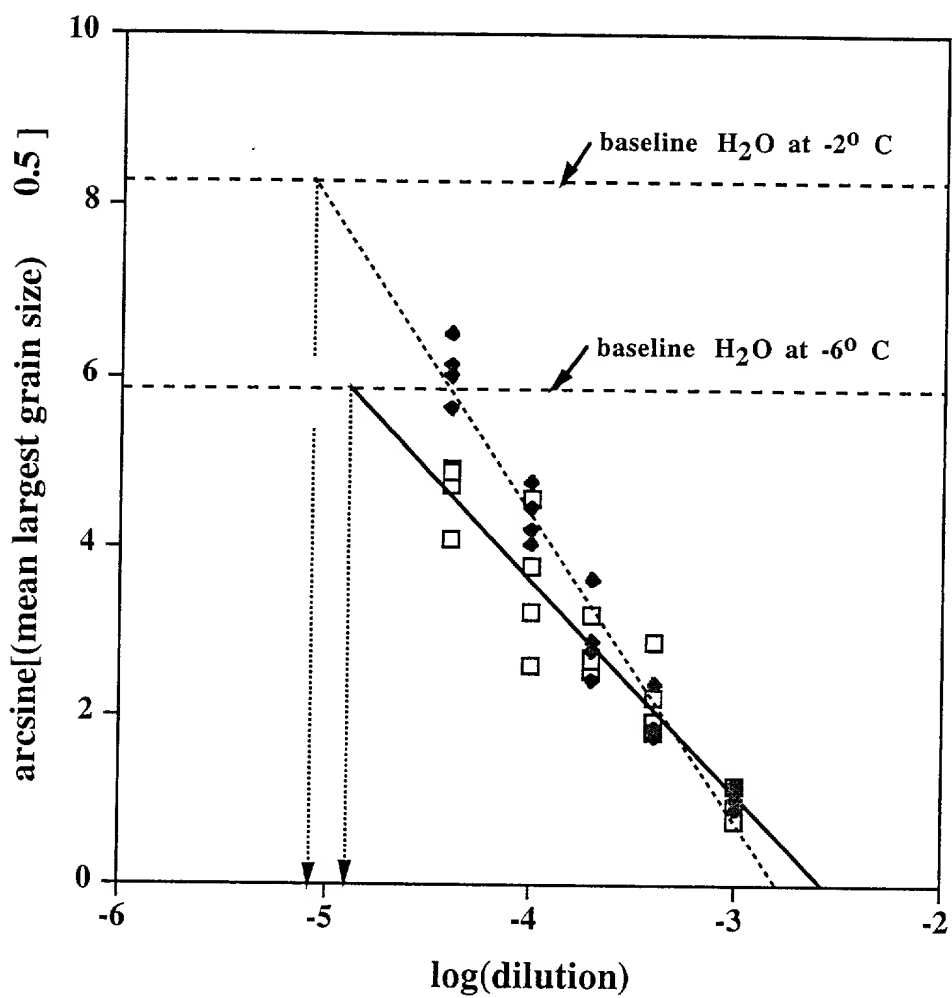


FIG. 8.21

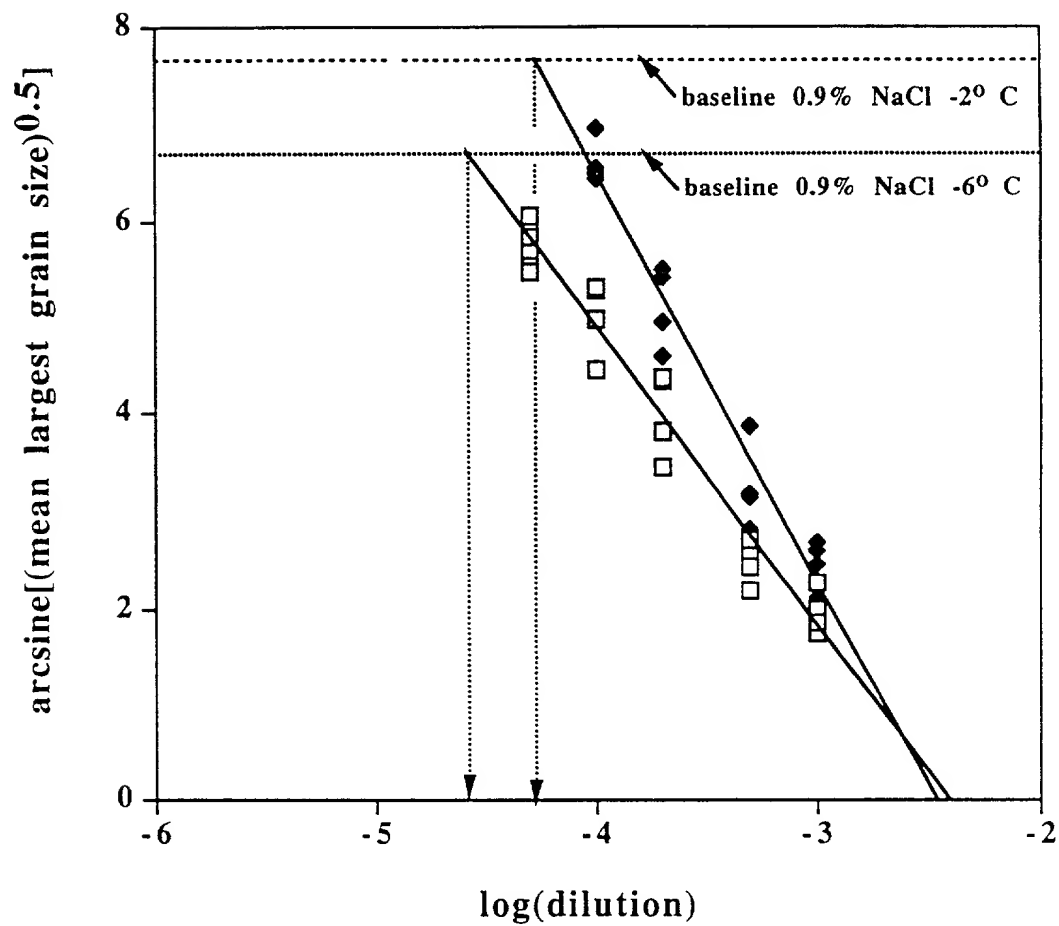


FIG. 8.22

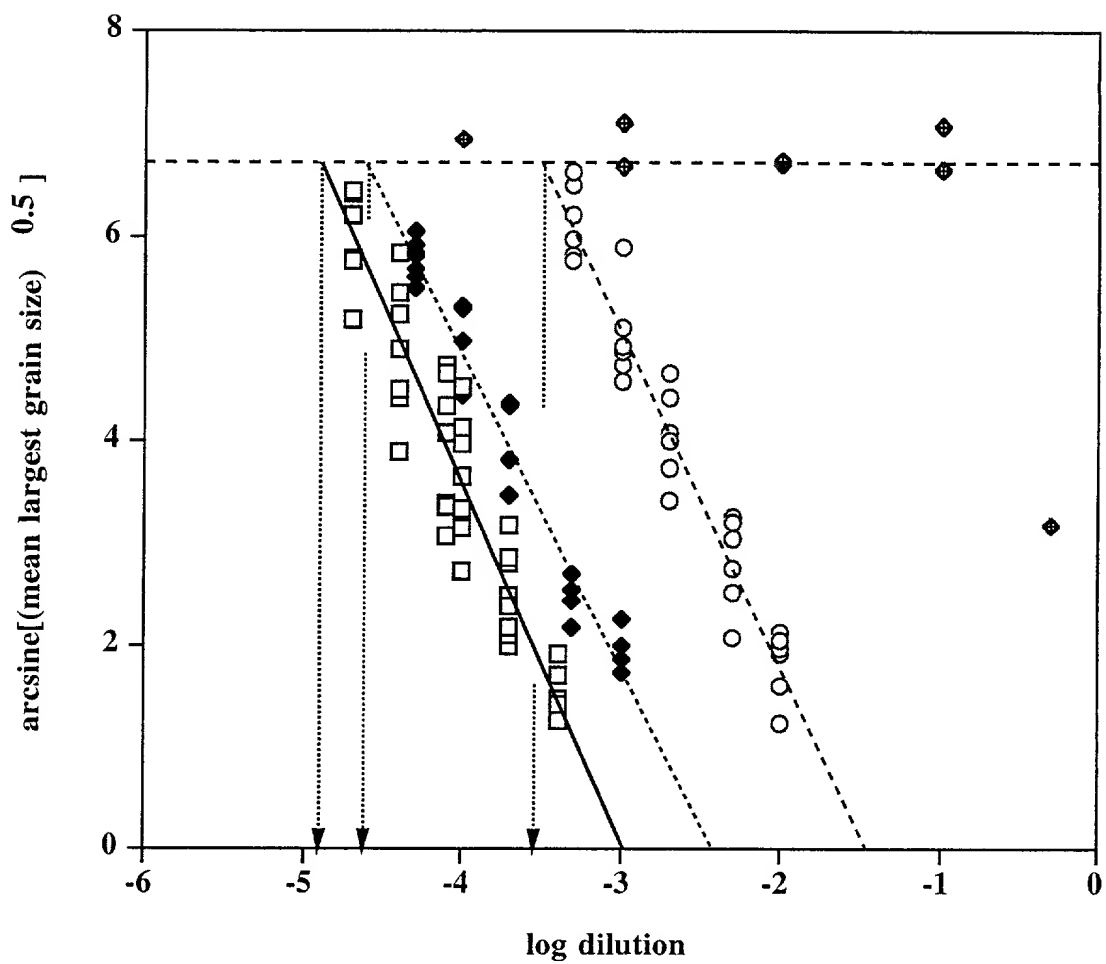


FIG. 8.23

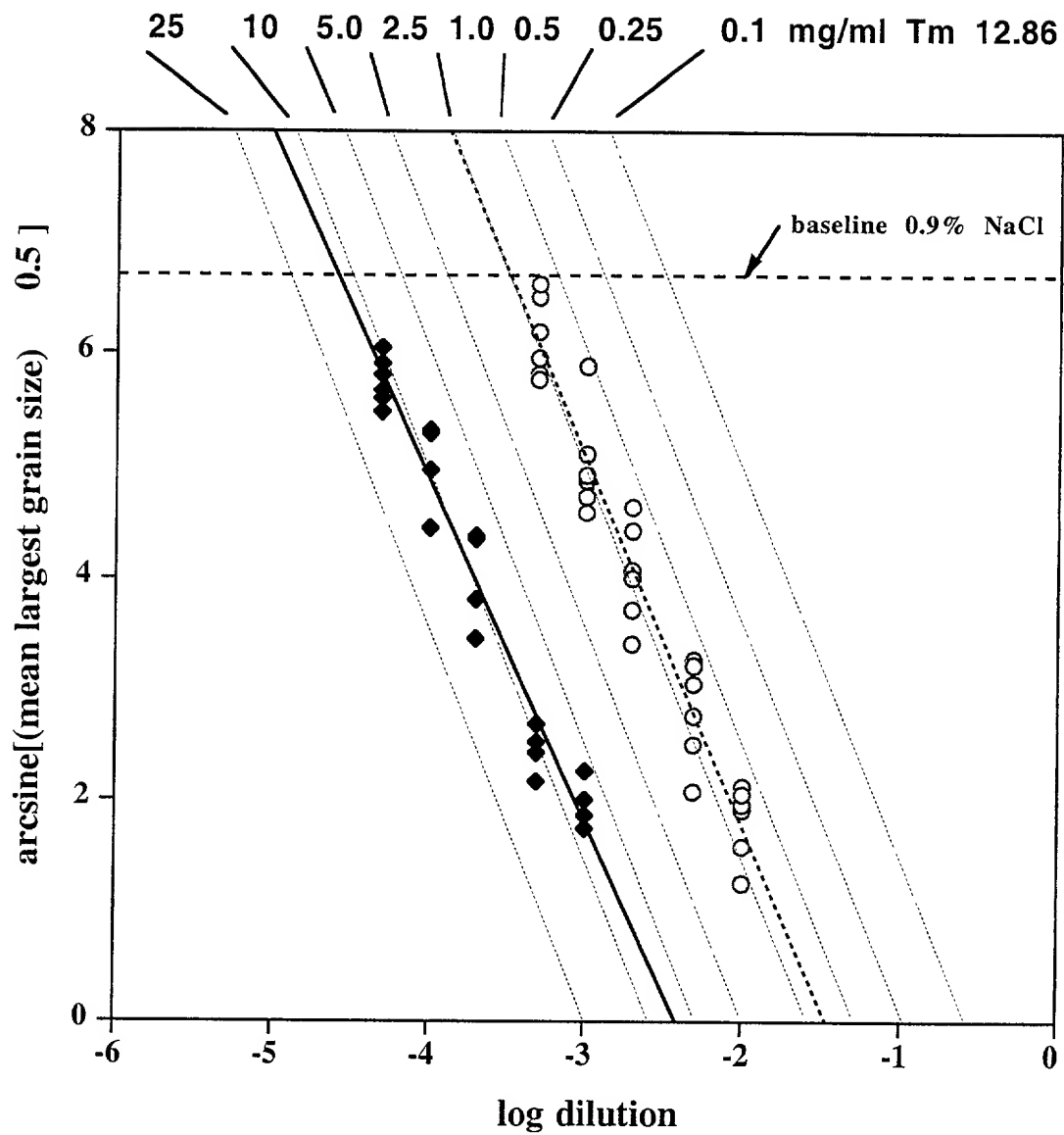


FIG. 8.24

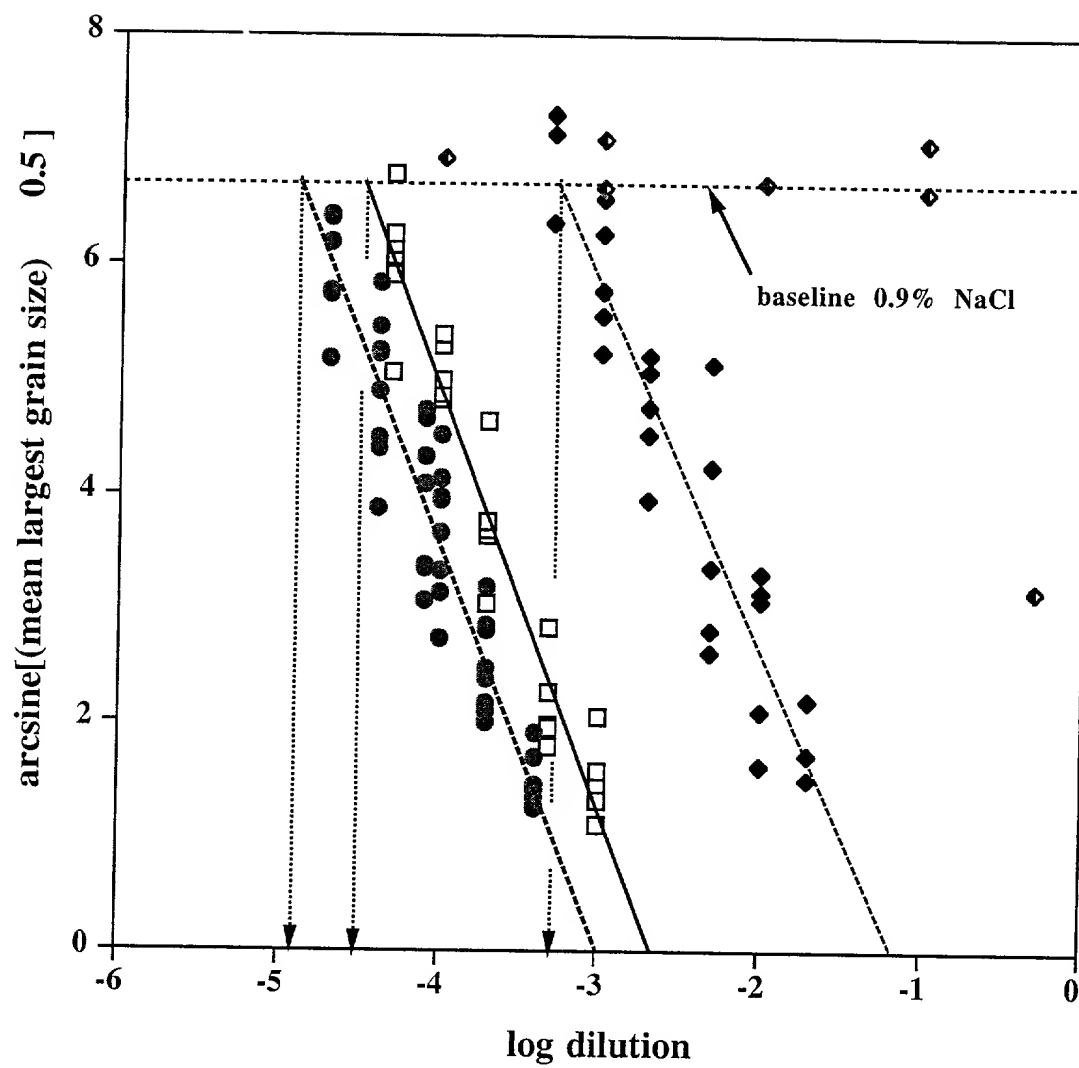


FIG. 8.25

T02090" 81E32860

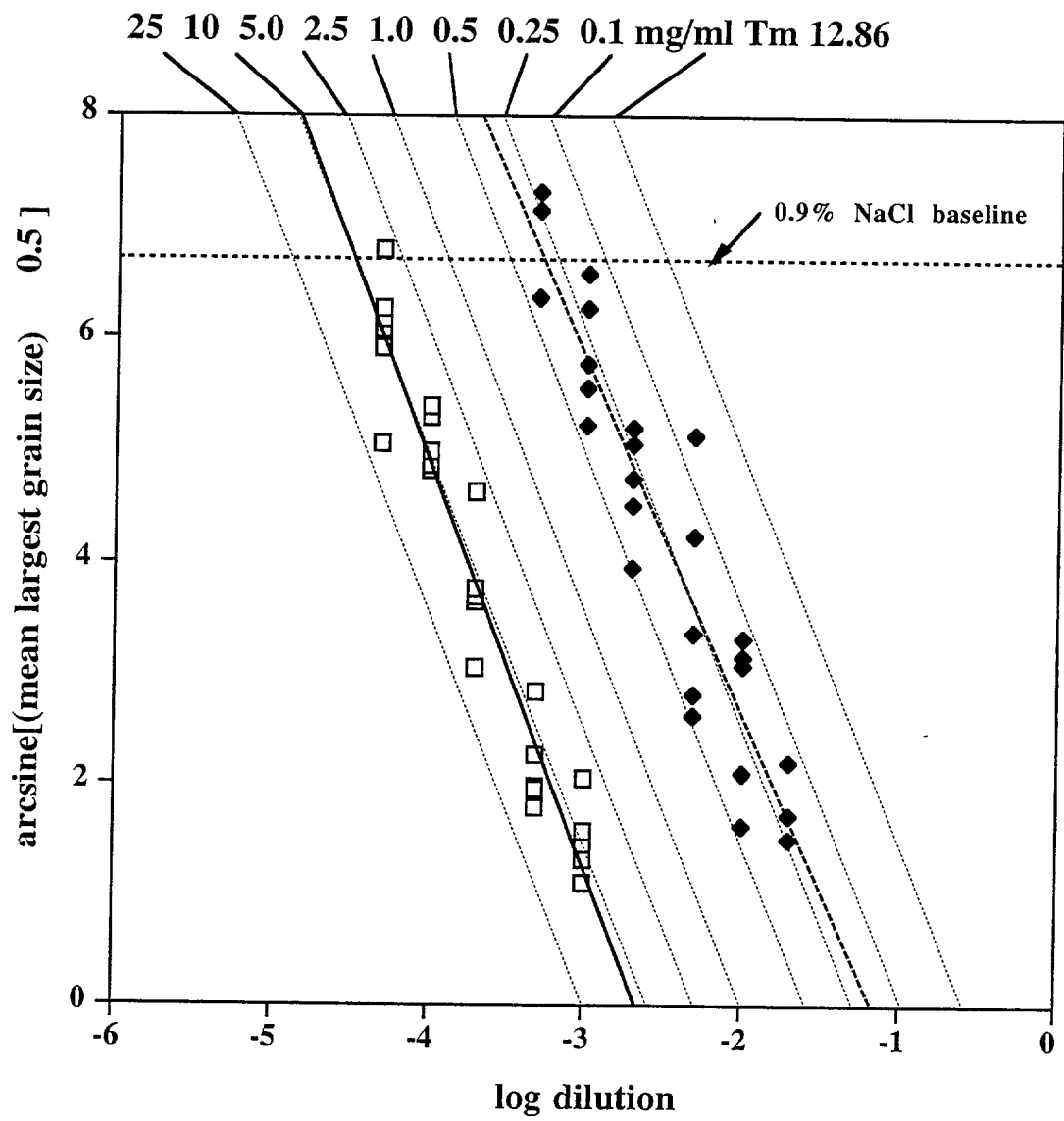


FIG. 8.26

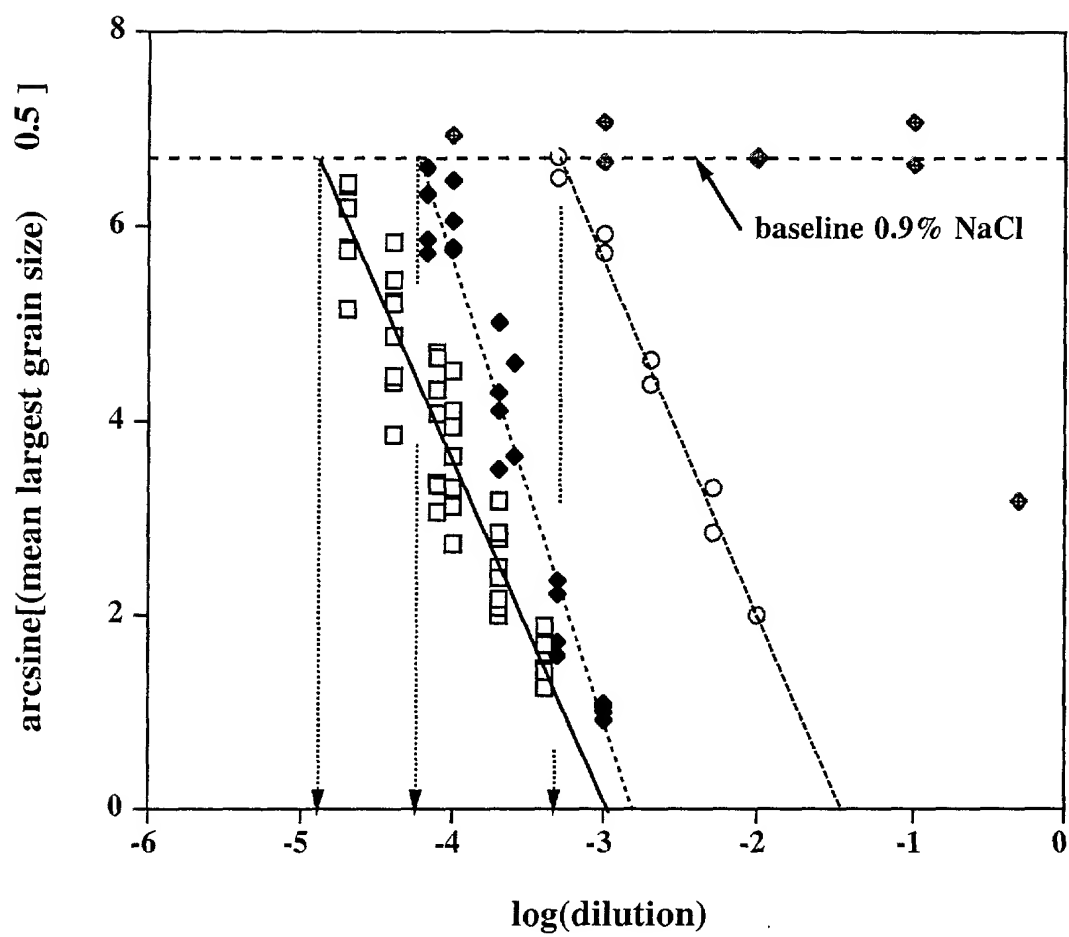


FIG. 8.27

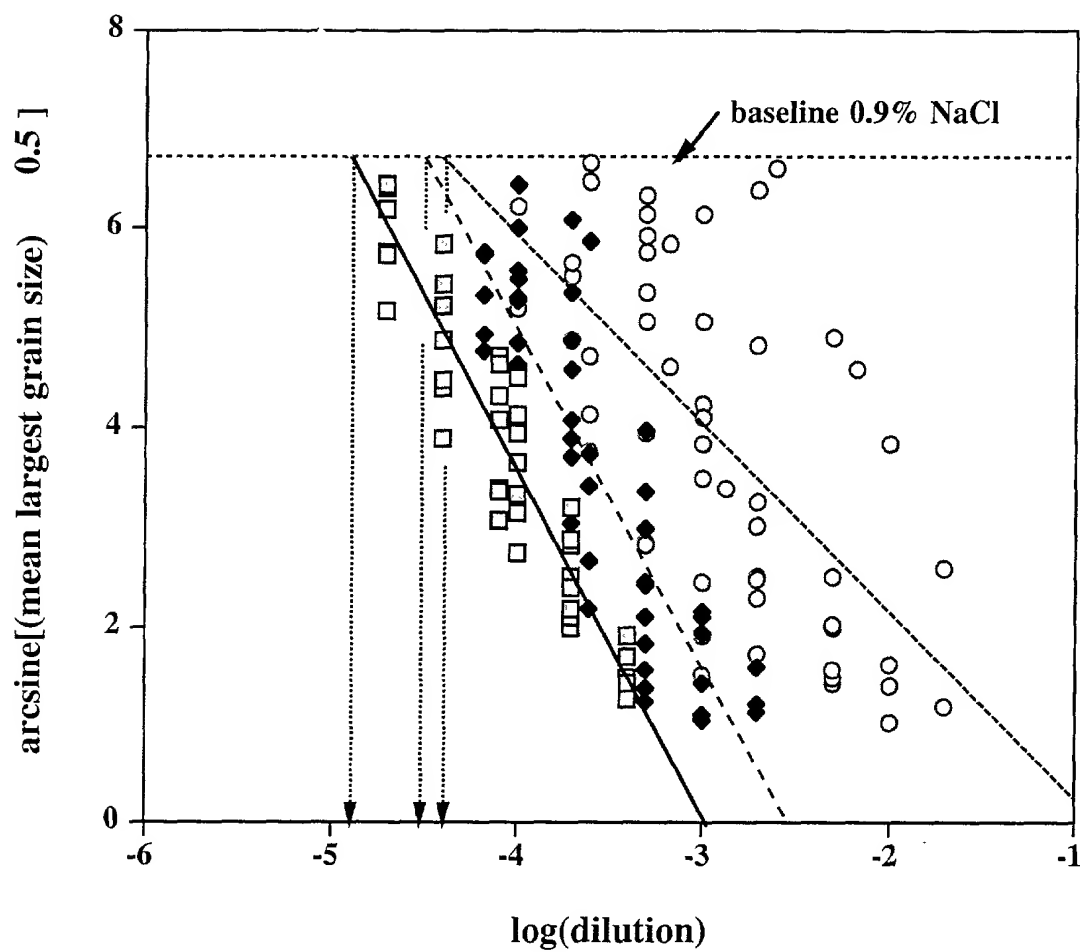


FIG. 8.28

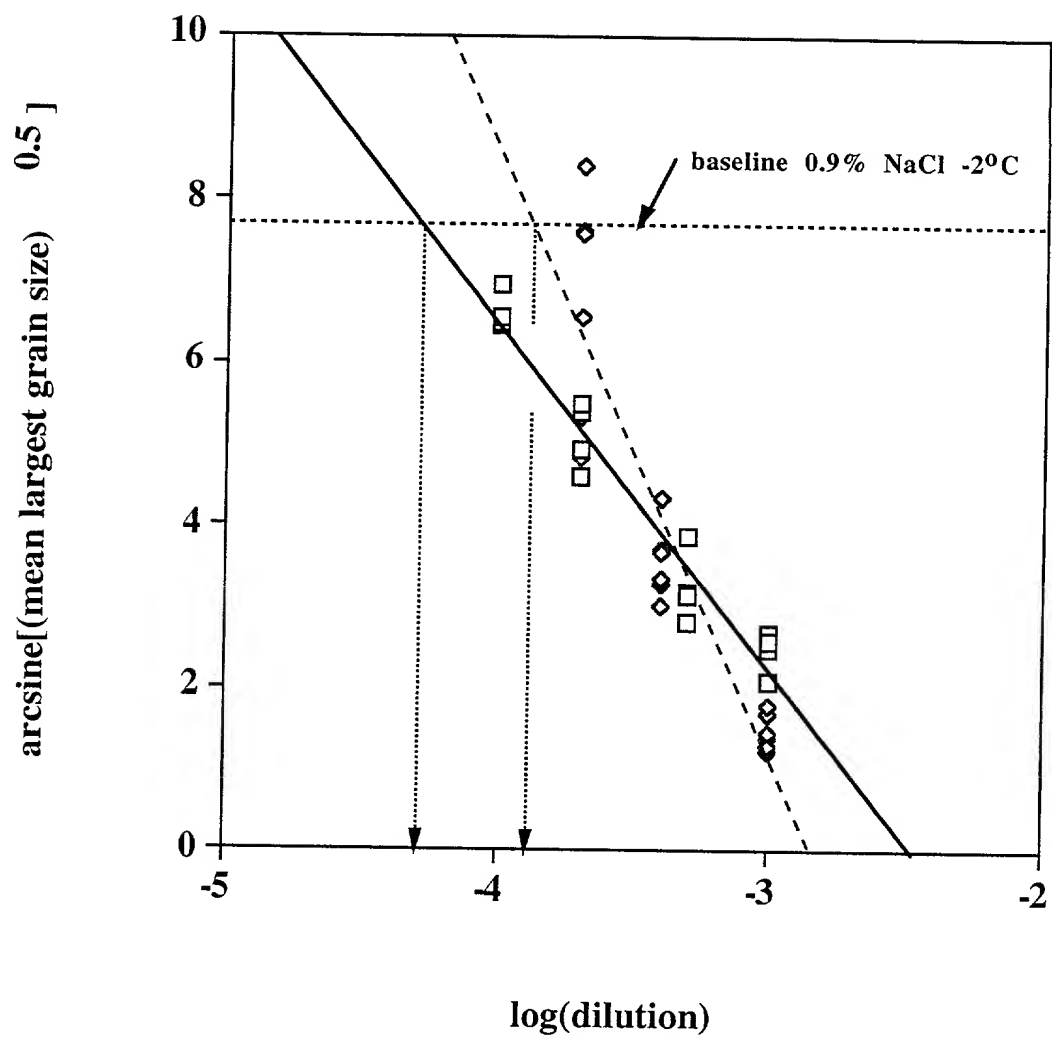


FIG. 8.29

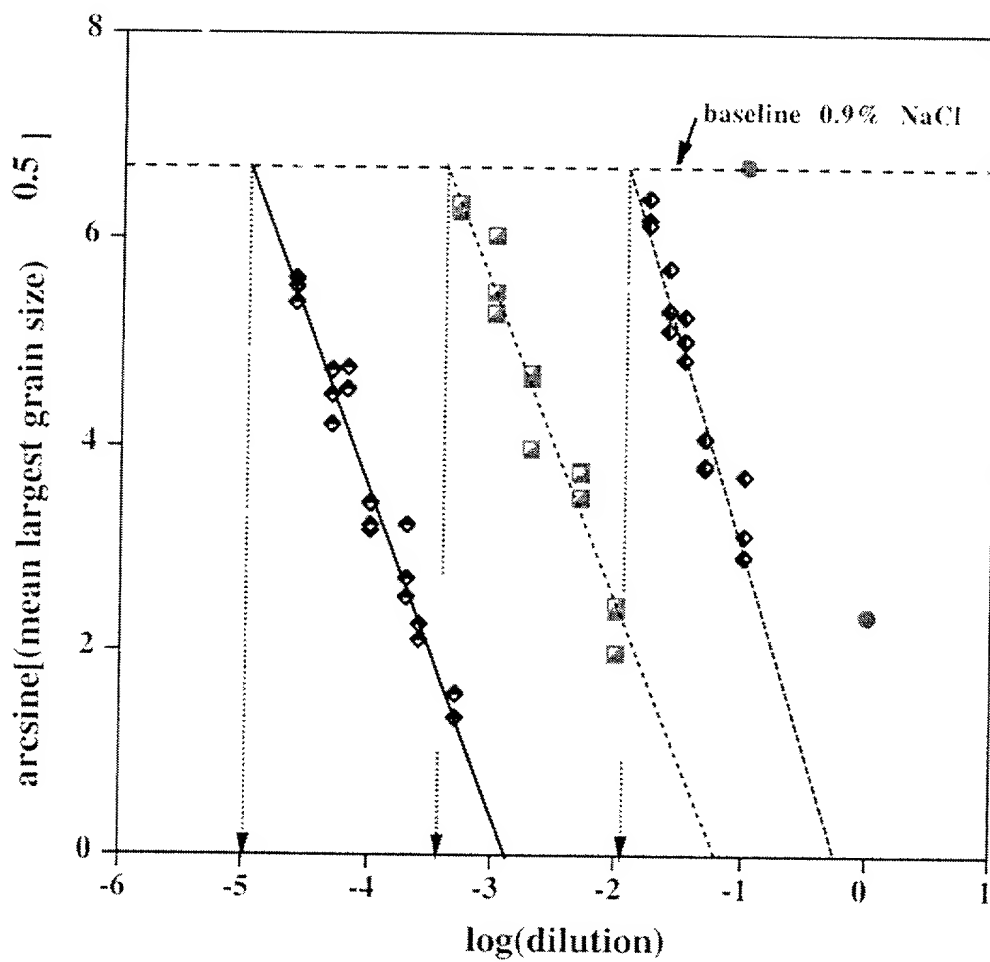


FIG. 8.30

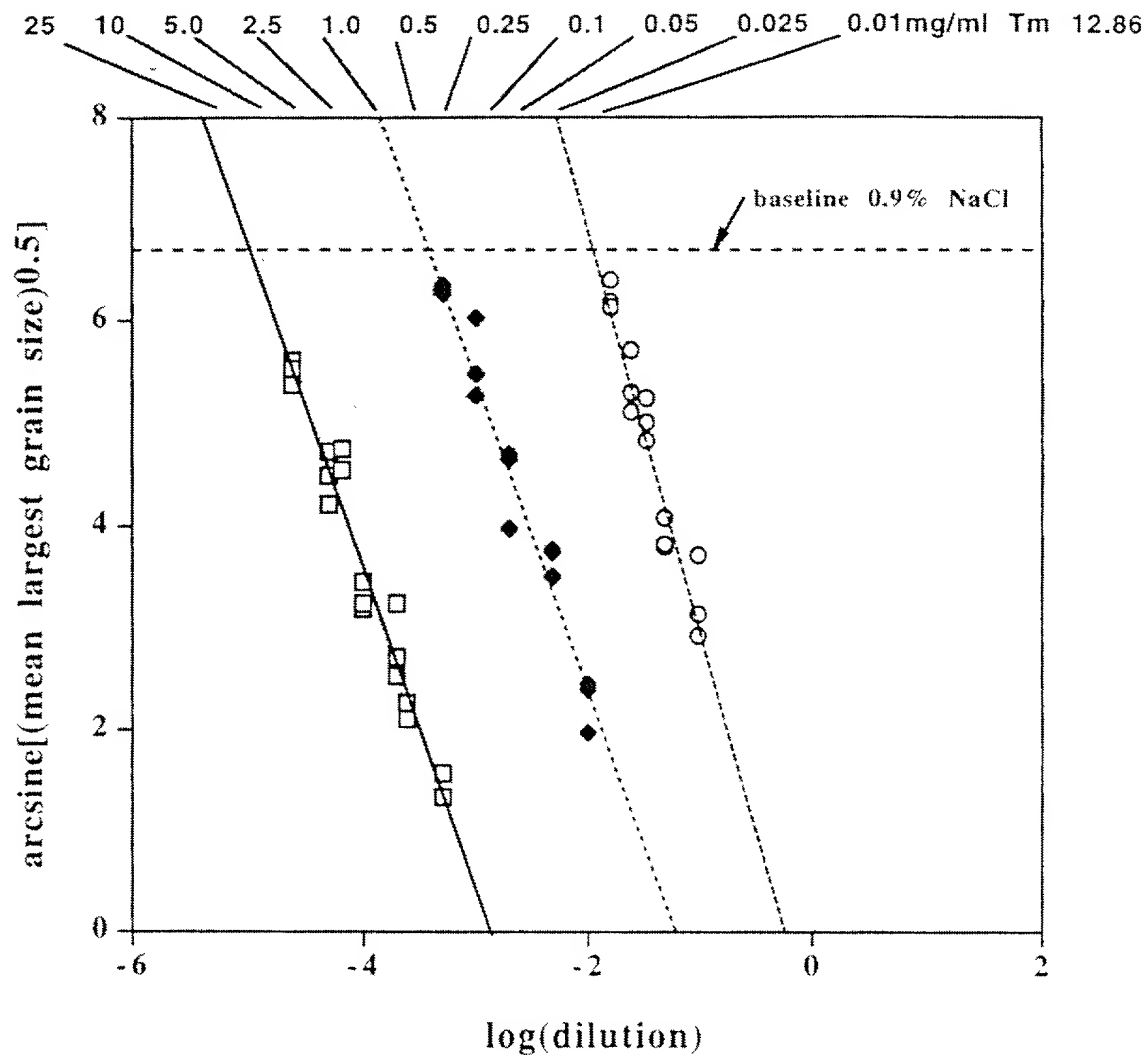


FIG. 8.31

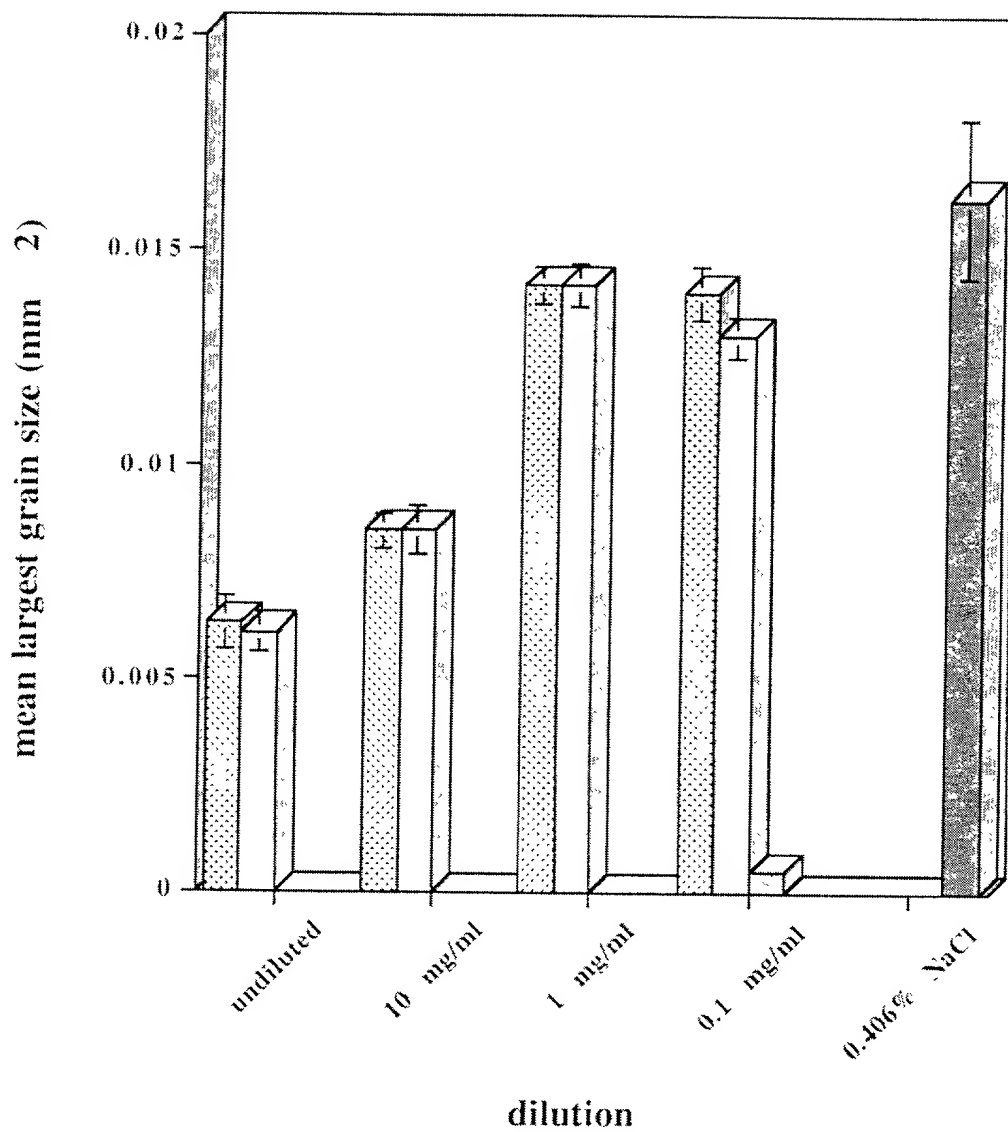


FIG. 8.32

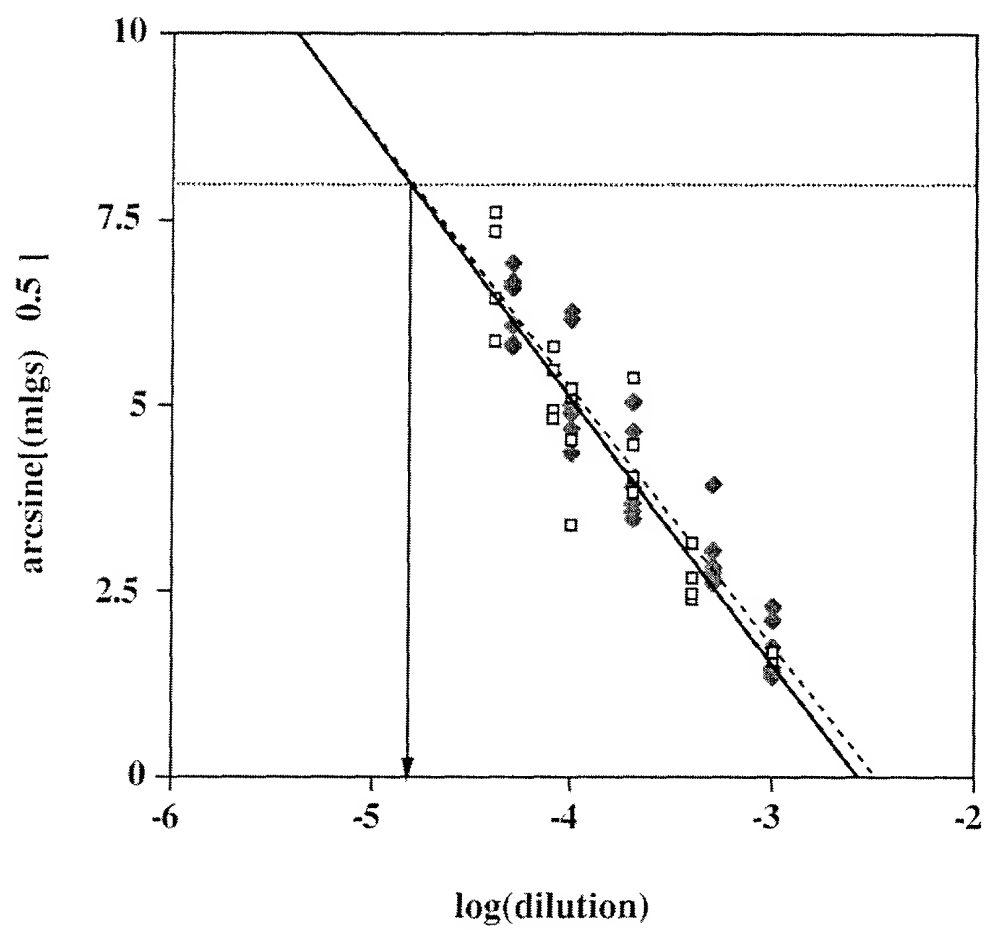


FIG. 8.33

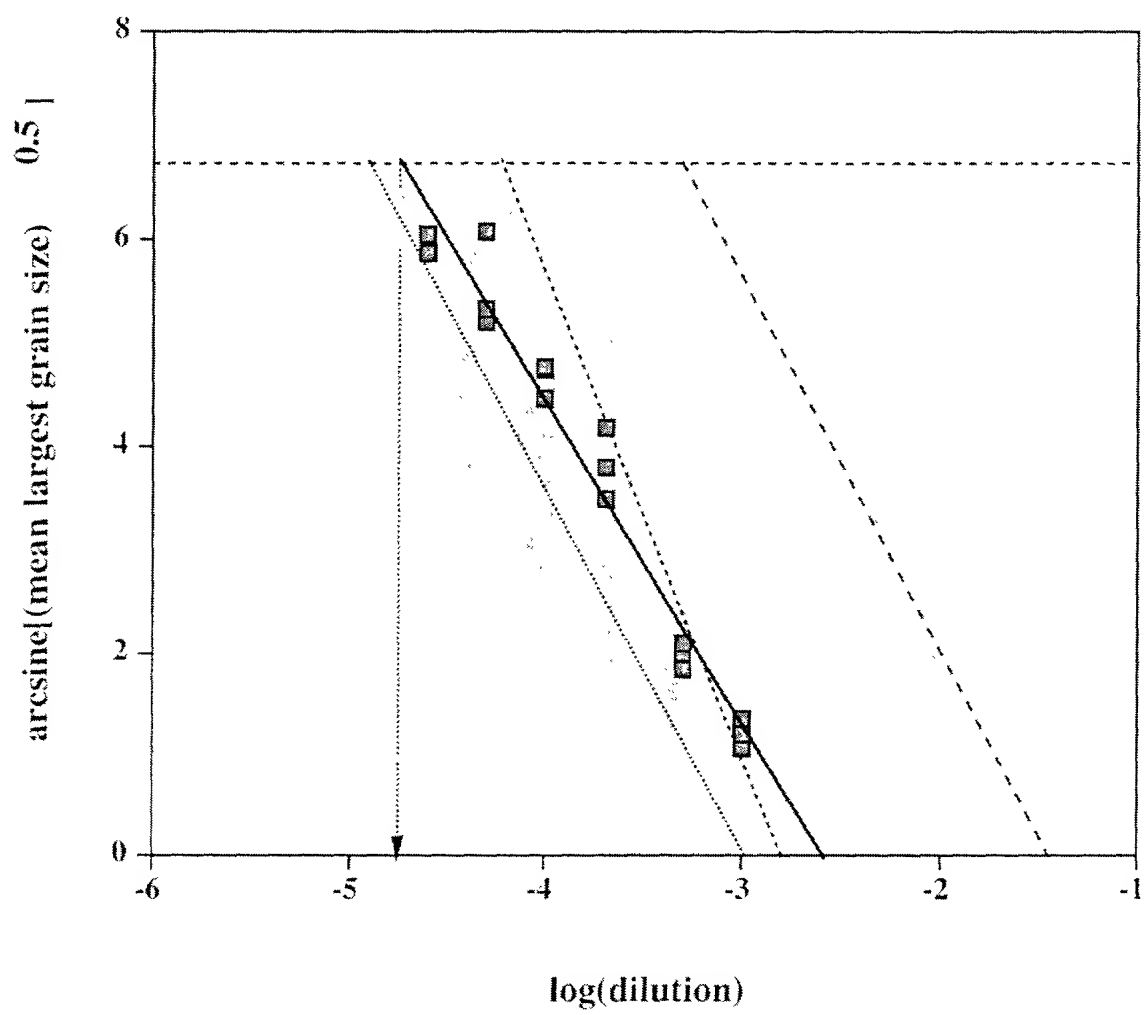


FIG. 8.34

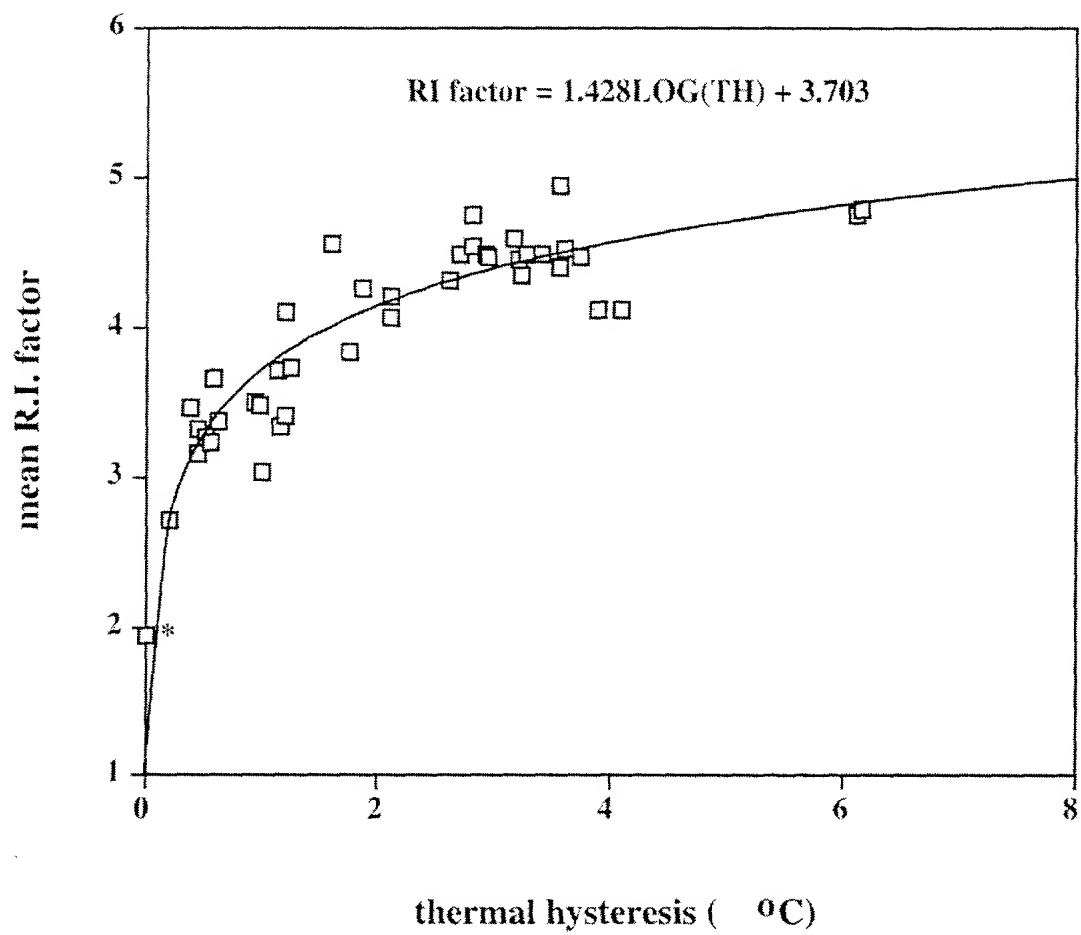


FIG. 8.35

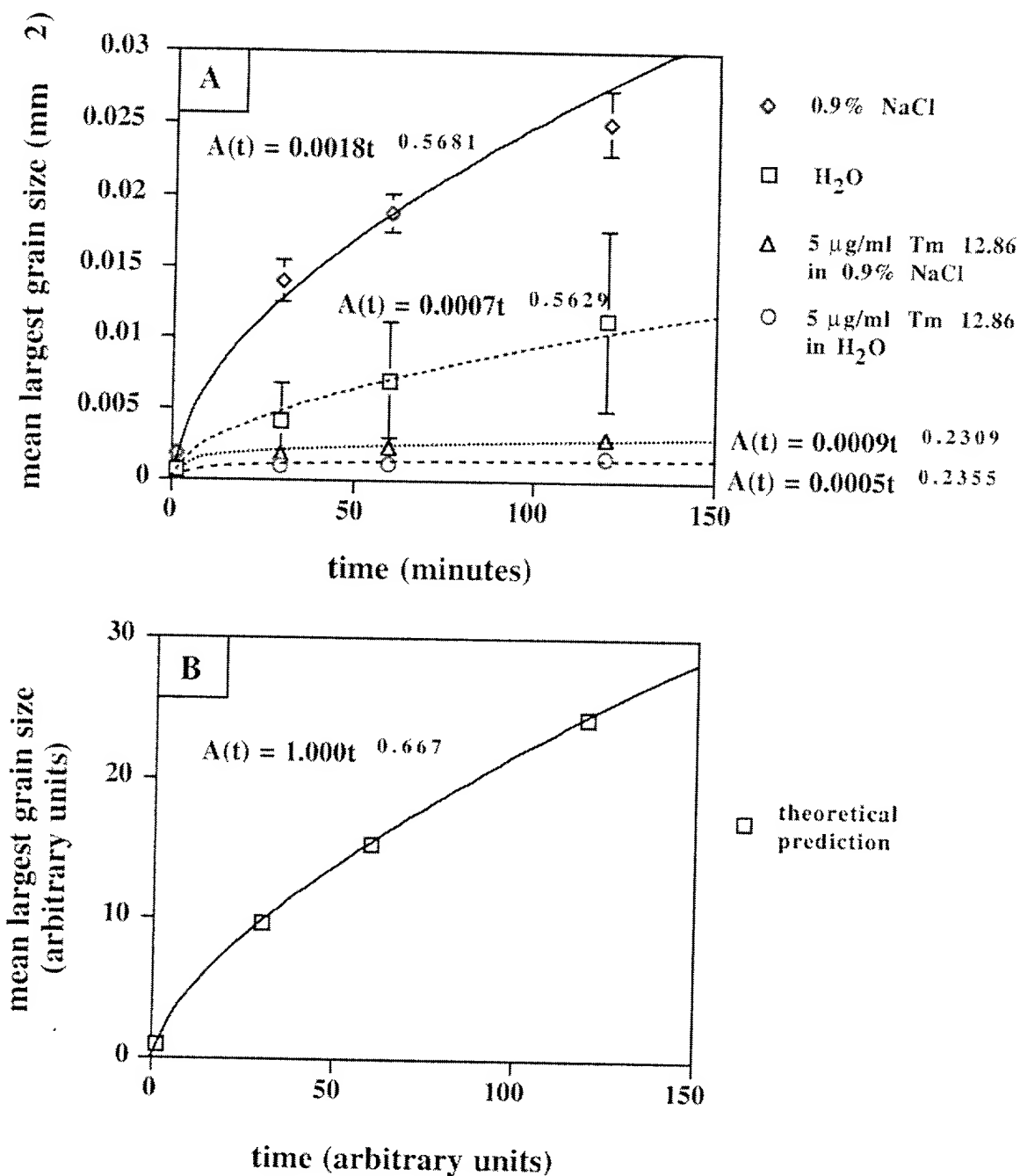
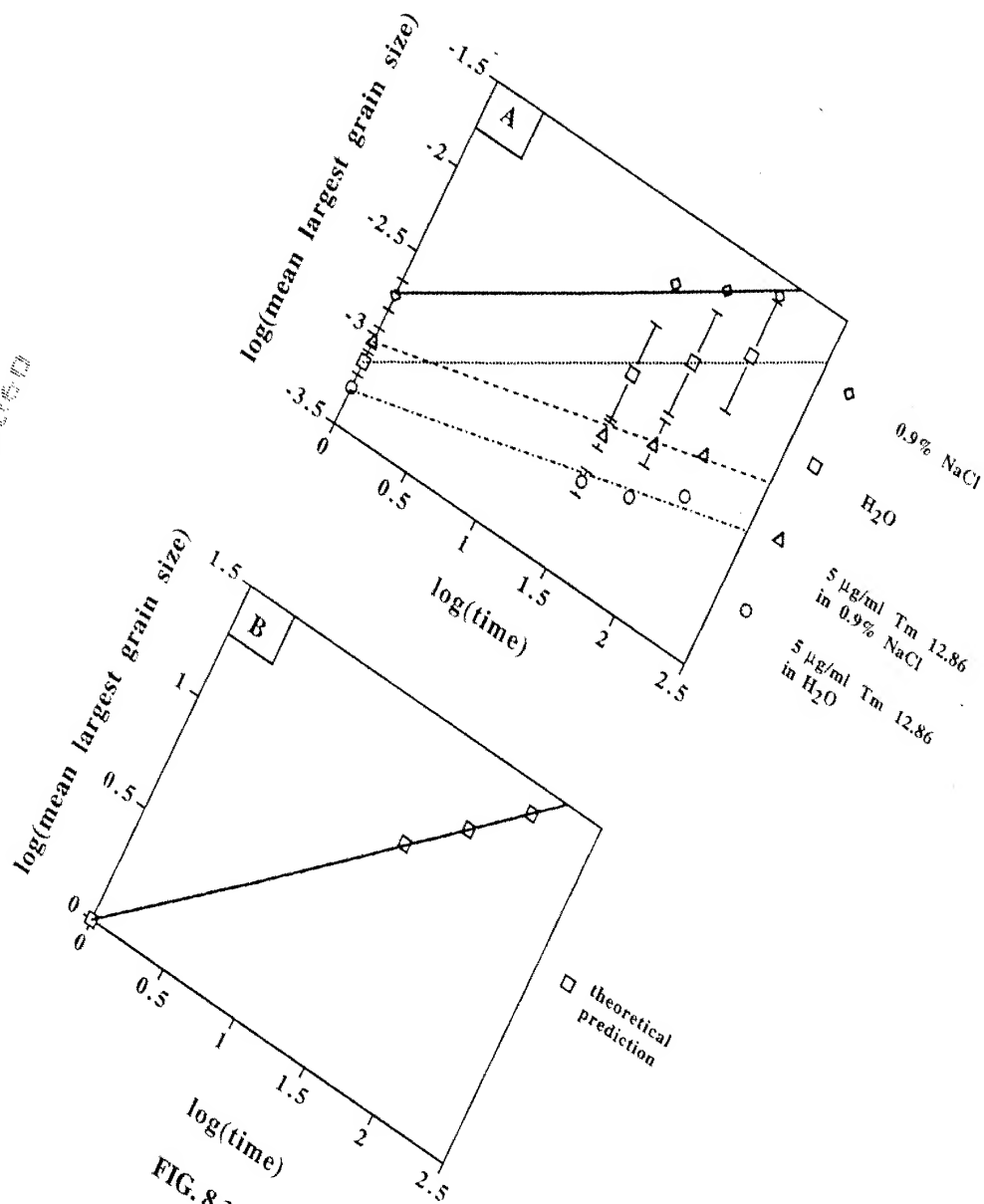


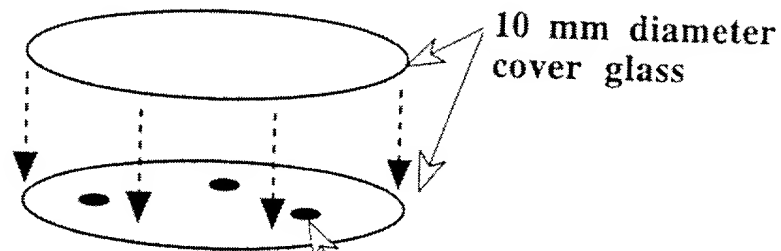
FIG. 8.36

TOXICOL. 24:49-50

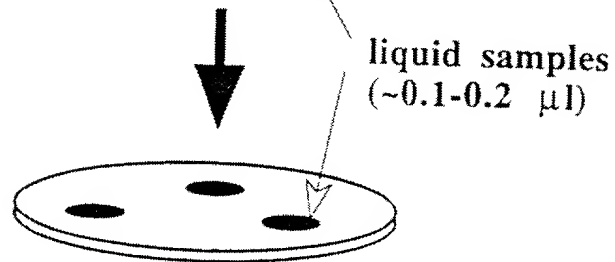


# "Sandwich" method of R.I. assessment

1.



2.



3. FREEZE ON  $\sim -80$  C  
ALUMINUM PLATE ( $\sim 10$  MIN.)



4. PLACE ON COLD STAGE,  
ANNEAL AT  $-6$  C UP TO  
12+ HOURS

FIG. 8.38

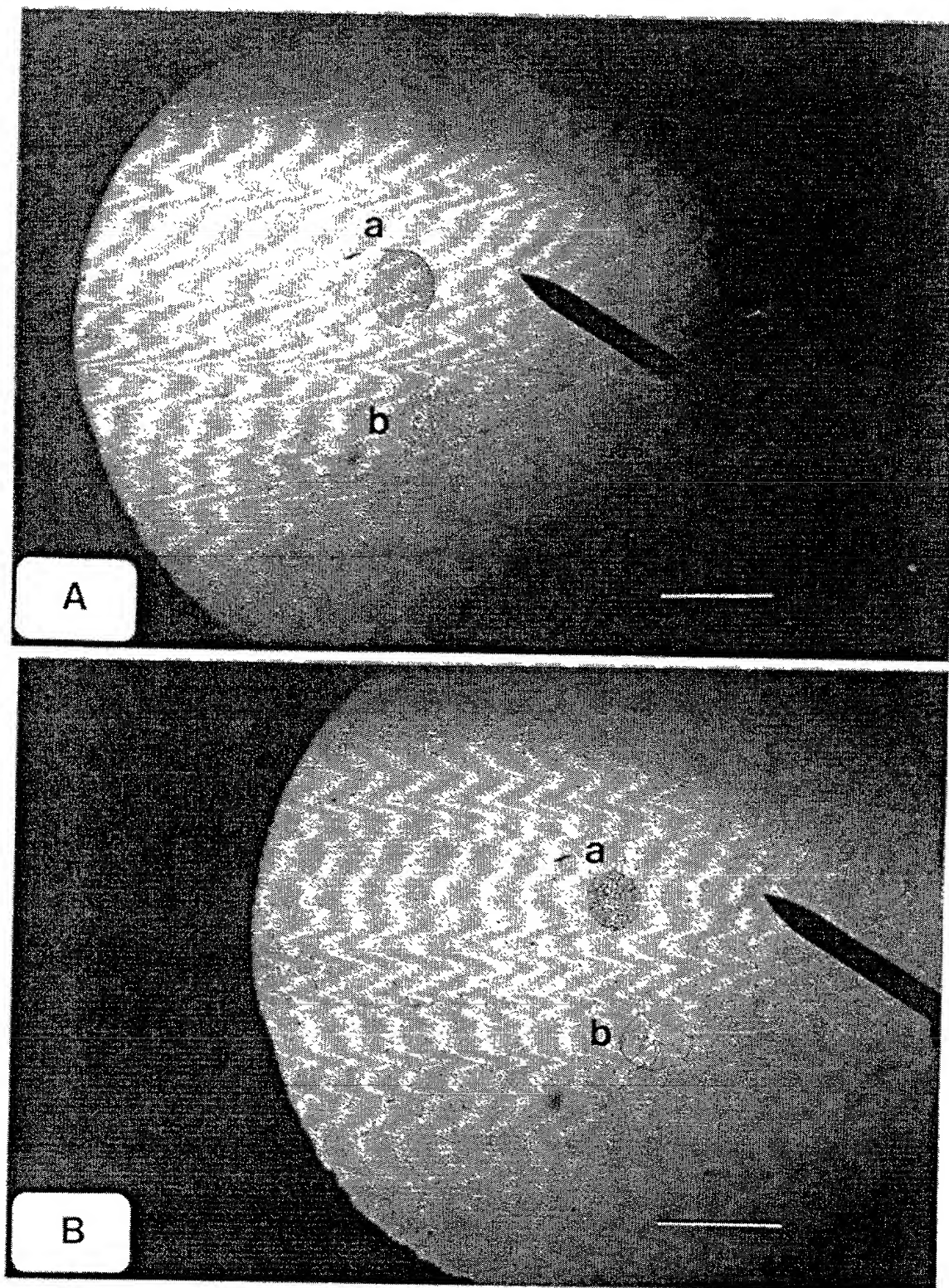


FIG. 8.39

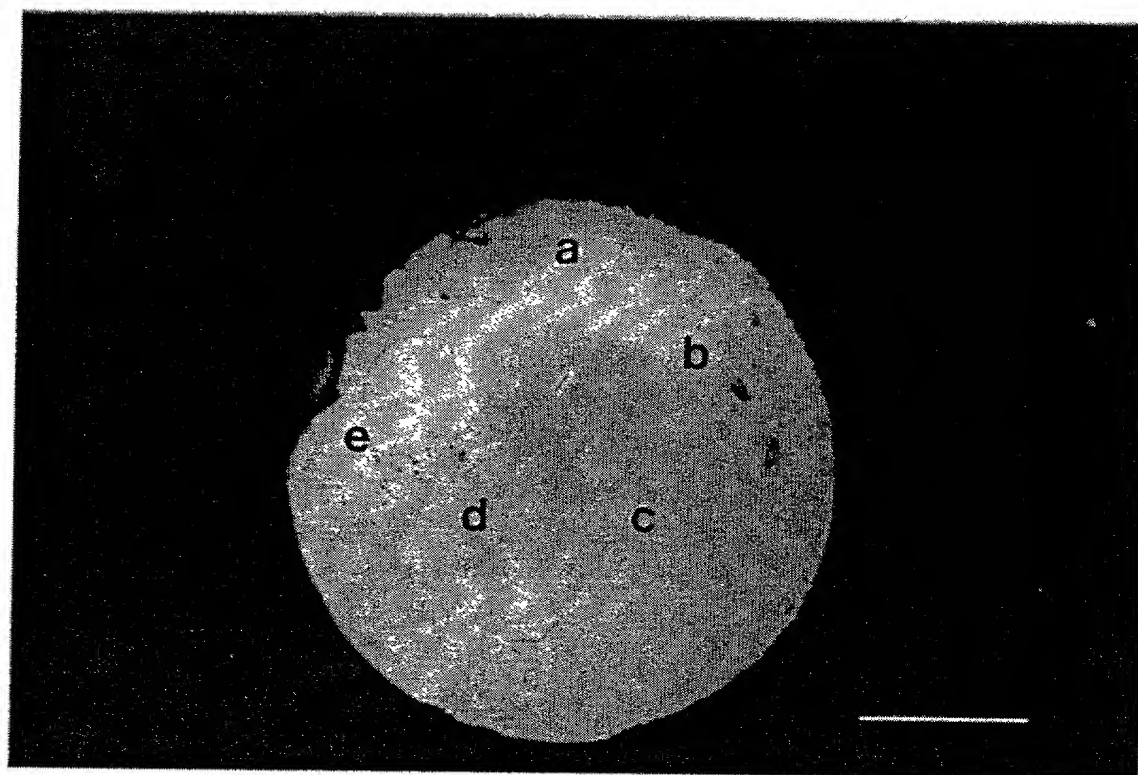


FIG. 8.40

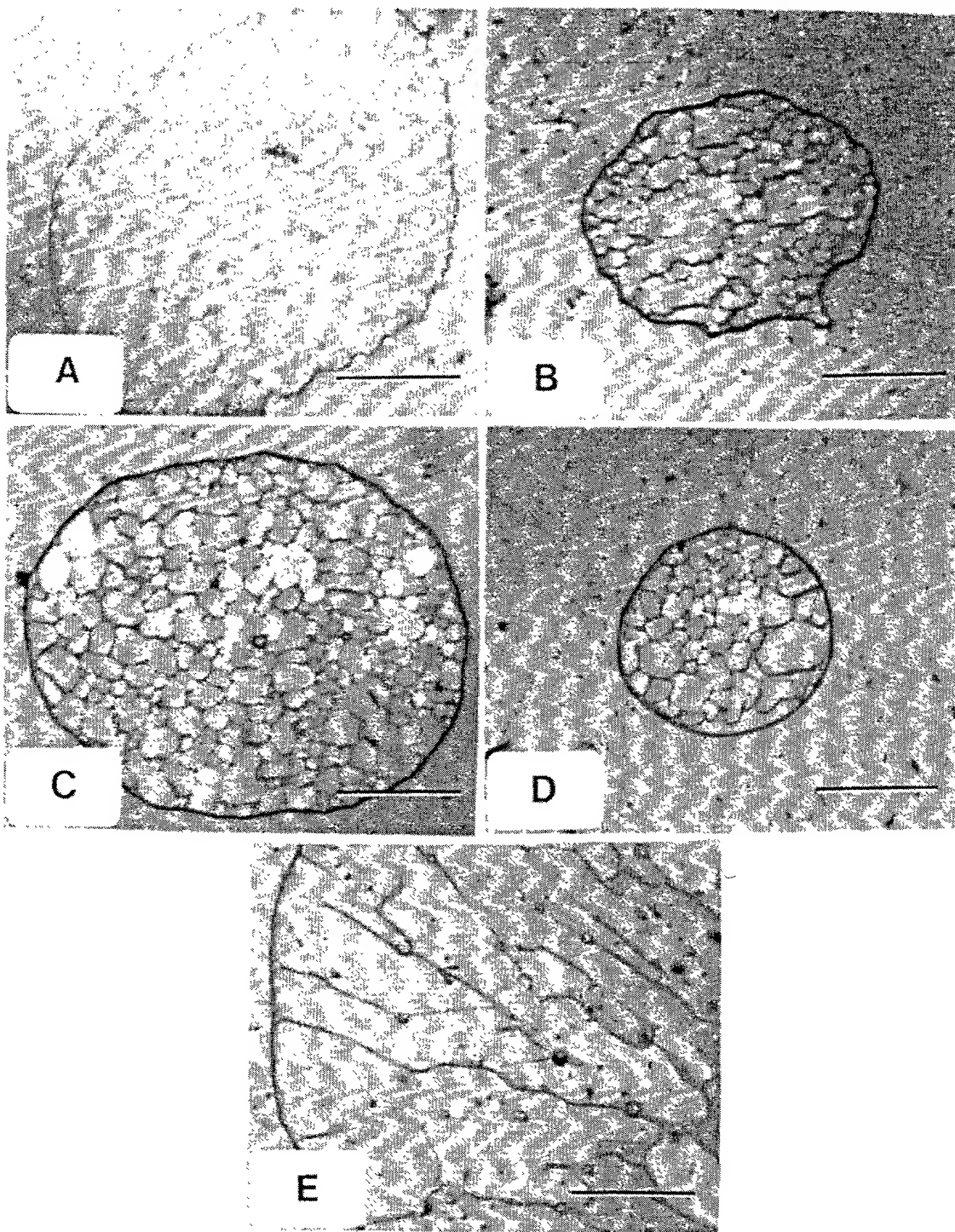


FIG. 8.41

104090" 34692860

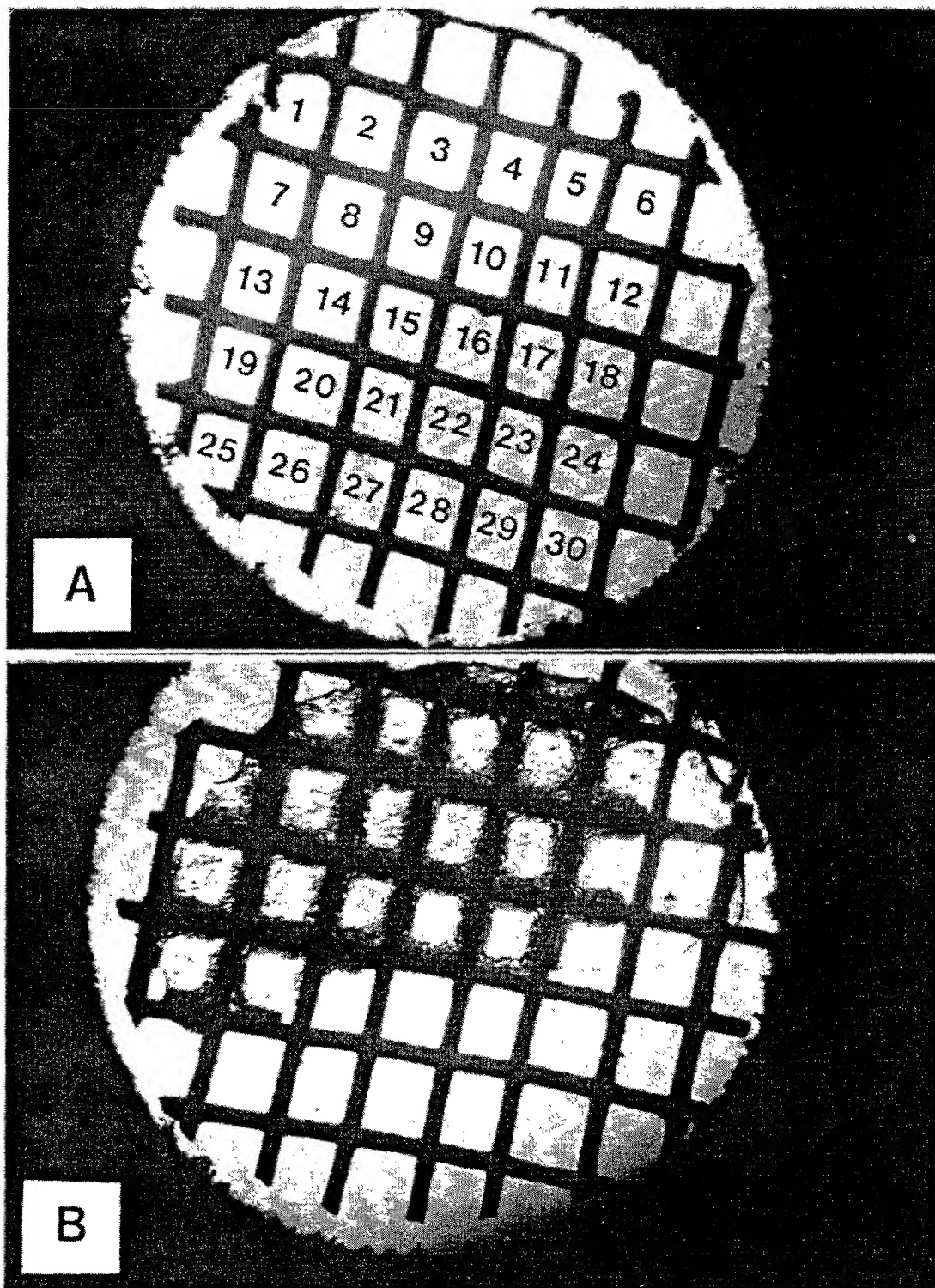


FIG. 8.42

# DNA sequence of Tm 13.17 cDNA clone

|   |   |
|---|---|
| B | E |
| a | C |
| m | O |
| H | R |
| I | I |

1 AGTGGATCCAAAGAATTCGGCACGAGACTACTAAGATGAAGTTGCTCTGTTGTCTAATCT  
M K L L C C L I S

61 CCCTCATTCTGTTGGTCACAGTTCAGGCCCTGACCGAGGCACAAATTGAGAACTGAACA  
L I L L V T V Q A L T E A Q I E K L N K

121 AGATCAGCAAAAAATGTCAAAATGAAAGTGGAGTGTGCGCAAGAGATCATAACCAAAGCTC  
I S K K C Q N E S G V S Q E I I T K A R

181 GCAACGGTGACTGGGAGGACGATCCTAAACTGAAACGCCAAGTTTTTTGCGTGGCCAGGA  
N G D W E D D P K L K R Q V F C V A R N

241 ACGCCGGTCTGGCCACGGAATCGGGAGAGGTGGTGGTCGACGTGTTGAGGGAGAAGGTGA  
A G L A T E S G E V V V D V L R E K V R

301 GGAAGGTCACCTGACAACGACGAAGAACTGAGAAAATCATCAATAAGTGCGCCGTCAAGA  
K V T D N D E E T E K I I N K C A V K R

361 GAGATACTGTTGAAGAGACGGTGTTCATACTTTCAAATGTGTCATGAAAAACAAGCCAA  
D T V E E T V F N T F K C V M K N K P K

421 AGTTCTCACCAGTTGATTGAACCACCACGACTAGTAGATGGTTCAAATGGTGTGCTTTAC  
F S P V D \*

481 ATATAAAAAATAAAGTGTCTGATGTAAAAAATAAAAAAAAAAAAAAAAAAAAAAACTC  
polyadenylation signal poly (A) tail (26)

537 AGAGTATTCTAGAGCGGCCGCGGGCCCATCGTTTTCCACCC

X  
h  
O  
I

FIG. 8.43

1    GGCACGAGCAAAAATGAAACTCCTCTTGTGCTTTGCGTTTCGCCGCC  
                                   M    K    L    L    L    C    F    A    F    A    A

47    ATCGTCATCGGAGCTCAGGCTCTCACCGACGAACAGATACAGAAA  
       I    V    I    G    A    Q    A    L    T    D    E    Q    I    Q    K

92    AGGAACAAGATCAGCAAAGAATGCCAGCAGGTGTCCGGAGTGTCC  
       R    N    K    I    S    K    E    C    Q    Q    V    S    G    V    S

137    CAAGAGACGATCGACAAAGTCCGCACAGGTGTCTTGGTCGATGAT  
       Q    E    T    I    D    K    V    R    T    G    V    L    V    D    D

182    CCCAAAATGAAGAAGCACGTCCTCTGCTTCTCGAAGAAAACCTGGA  
       P    K    M    K    K    H    V    L    C    F    S    K    K    T    G

226    GTGGCAACCGAAGCCGGAGACACCAATGTGGAGGTACTCAAAGCC  
       V    A    T    E    A    G    D    T    N    V    E    V    L    K    A

271    AAGCTGAAGCATGTGGCCAGCGACGAAGAGGTGGACAAGATCGTG  
       K    L    K    H    V    A    S    D    E    E    V    D    K    I    V

316    CAGAAGTGCGTGGTCAAGAAGGCCACACCAGAGGAAACGGCTTAT  
       Q    K    C    V    V    K    K    A    T    P    E    E    T    A    Y

361    GACACCTTCAAGTGTATTTACGACAGCAAACCTGATTTCTCTCCT  
       D    T    F    K    C    I    Y    D    S    K    P    D    F    S    P

406    ATTGATTAAATTGTTTTGTATTTGACTGAATTTTGACAATAAAGGT  
       I    D    \*

polyadenylation signal

451    ACTATCGTTATGTAAAAAAAAAAAAAAAAAAAA

poly (A) tail

**FIG. 8.44**